ooth Umpqua River/Gal Successional Reserve A. (LSR #RO223) Glendale Field Office, Medford District, BLM South River Field Office, Roseburg District, BLM Tiller Kanger District, Umpqua National Forest, USFS July 1999

South Umpqua River/Galesville Late-Successional Reserve Assessment

(LSR #RO223)



Glendale Field Office, Medford District, BLM South River Field Office, Roseburg District, BLM Tiller Ranger District, Umpqua National Forest, USFS



July 1999

REGIONAL ECOSYSTEM OFFICE

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MEMORANDUM

DATE:

July 2, 1999

TO:

Elaine Y. Zielinski, State Director, Bureau of Land Management OR/WA

Nancy Graybeal, Acting Regional Forester, Region 6, Forest Service

FROM:

Donald R. Knowles, Executive Director

SUBJECT:

Regional Ecosystem Office Review of South Umpqua River/Galesville Late-Successional

Reserve Assessment

Summary

The Regional Ecosystem Office (REO) and the interagency Late-Successional Reserve (LSR) Work Group have reviewed the South Umpqua River/Galesville Late-Successional Reserve Assessment (LSRA). Future silvicultural activities described in the LSRA and meeting the REO memoranda exemption criteria, and short-term risk activities subject to limitations stated later in this document and described in the LSRA and meet its criteria and objectives and that are also consistent with the S&Gs in the NFP, are exempted from subsequent project-level REO review.

Basis for the review

Under the Standards and Guidelines (S&Gs) for the Northwest Forest Plan (NFP), a management assessment should be prepared for each large LSR (or group of smaller LSRs) before habitat manipulation activities are designed and implemented. As stated in the S&Gs, these assessments are subject to REO review. The REO review focuses on the following:

- 1. Under the S&Gs for the NFP, a management assessment should be prepared for each large LSR (or group of smaller LSRs) before habitat manipulation activities are designed and implemented. These assessments are subject to REO review. This review considers whether the assessment contains sufficient information and analysis to provide a framework and context for making future decisions on projects and activities. The eight specific subject areas that an assessment should generally include are found in the NFP (S&Gs, page C-11). The REO may find that the assessment contains sufficient information or may identify topics or areas for which additional information, detail, or clarity is needed. The findings of the review are provided to the agency or agencies submitting the assessment.
- 2. The review also considers treatment criteria and potential treatment areas for silvicultural, risk-reduction, and salvage activities if addressed in the LSRA. When treatment criteria are clearly described and their relationship to achieving desired late-successional conditions are also clear, subsequent projects and activities within the LSR(s) may be exempted from future REO review, provided they are consistent with the LSRA criteria and S&Gs. The REO authority for developing criteria to exempt these actions is found in the S&Gs (pages C-12, C-13, and C-18). If such activities are not described in the LSRA and exempted from future review in this memorandum, they

remain subject to future REO review.

Both aspects of this review are described separately below.

Scope of the Assessment and Description of the Assessment Area

The LSRA addresses one LSR on the Roseburg and Medford Districts of the Bureau of Land Management (BLM) and the Umpqua National Forest totaling about 66,900 acres. The LSR is a major habitat link between the Coast Range and Cascade Provinces. Unmapped 100-acre owl cores, Protection Buffer Managed Late-Successional Areas (MLSAs), and additional reserves identified in the Roseburg BLM District Land and Resource Management Plan are also included in this assessment. The LSR is addressed in the context of a 104,140 acre assessment area, bounded on the north by the Umpgua Valley, on the east by a block of Forest Service land, on the south by Rogue River Valley, and on the west by the I-5 Corridor. The LSR landscape is dominated by intermingled BLM and private forest lands.

Review of the Assessment

The REO reviewed the LSRA in light of the eight subject areas identified in the NFP S&Gs, page C-11. The REO finds the LSRA provides a sufficient framework and context for making future decisions on projects and activities within the LSR.

Review of Projects

Silvicultural projects described in the LSRA propose to follow the REO memoranda "REO Review Exemption Criteria" (April 20, 1995) or "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" (July 9, 1996) as modified by a September 30, 1996 amendment. Projects following these criteria and otherwise consistent with the NFP S&Gs are exempt from future REO project level review. The REO suggests a copy of these memoranda criteria be added to the LSRA Appendix. In addition, short-term risk reduction actions, as described on pages 65-66 which target activity fuels less than 3 inches diameter following treatment activities, except for the construction of shaded fuel breaks, and that are otherwise consistent with the NFP S&Gs are exempt from future REO project level review.

Review of proposed activities described in the LSRA is limited to silvicultural, risk reduction, and salvage activities. Projects described in the LSRA other than silvicultural, risk reduction, or salvage, have not been reviewed for consistency with the Record of Decision (ROD). Therefore, this review does not make a finding on developments proposed such as the Galesville Reservoir Campground Development (page 83), special forest product collections, or road construction and maintenance including expansion of existing quarries. In all cases, the Forest Service and BLM administrative units will need to evaluate whether the activity is consistent with the S&Gs in the ROD.

Assumptions and Clarifications

While we find that the assessment provides sufficient framework and context for evaluating future projects and activities, we also find that our review of the assessment leads us to suggest a number of clarifications for better understanding, and assumptions to further delineate conditions under which we can find activities consistent. Based on our review of the document and conversations with members of the LSRA team, it is assumed that:

 Additional LSRs: The 100-acre known Spotted Owl Activity Centers and the Protection Buffer sites (unmapped LSRs) included in the LSRA are those that are within 10 miles of the one mapped LSR and in the same six vegetation zones identified and described on pages 14-15.

- Areas of high priority for treatment: Bland Mountain fire area of the Roseburg BLM District, the central portion of the Medford BLM District, owl home ranges within the LSR that are less than 30 percent suitable habitat, and the early seral stand created by timber harvest (pages S-3, 52 and 55) will be identified on a suitable map(s) and made part of the LSRA. These maps will be submitted to the REO for review before described management activities proceed.
- Timeframe to attain objective: "The objective for management in this LSR will be to attain and maintain 60 to 75% of the Federal lands in late-successional forest" (page S-2). Based on information in Table 1, "Relative Quantities of Seral Stages (Age Classes) by Ownership in the LSR," it will take 40 years to potentially attain a level of 55% late-successional habitat (as described on page 19) and up to 80 years to potentially attain the 60-75% late-successional forest objective. In light of current low amounts of late-successional habitat, we assume there will be no management related reduction of suitable habitat until the objective is attained.
- Clarification: The LSRA should be amended to clarify when "exceptions" to statements will occur. Examples are: "In most cases, they [unmapped LSRs] will be managed to maintain the existing late-successional and old-growth conditions" (page 2), and "In general, no trees greater than 20" dbh would be cut" (page 75). Regardless of such statements and subsequent edits, any treatments departing from specific treatment criteria described in the LSRA and referenced in this memorandum remain subject to REO review.
- Minimum values: Page 41 states: "The LSR will be managed to exceed the minimum values, as detailed on the following pages." Not withstanding the labels on Tables 2 and 3, we understand the values under "Interim Standards" on Table 2, and "Average Standards" on Table 3 are intended as the minimum needed to achieve desired outcomes, and our consistency finding is based on using these as management minimums.
- Enhancing Spotted Owl Activity Centers: Maintaining "best habitat" (page 54) refers to the retention of nesting, roosting, and foraging habitat (collectively NRF habitat). It is our understanding that NRF habitat will not be treated. "The purpose here is to locate forest age classes adjacent to suitable habitat ... that may be manipulated to accelerate stand development toward late-successional characteristics" (Appendix D).
- Risk reduction treatment priorities: Table 10, "Risk reduction treatment priority" (page 64), prioritizes stands to be <u>protected</u>, not stands to be <u>treated</u>. The priority is to protect (maintain/retain) the best functional habitats "indirectly" (page 63).
- Coarse woody material and snag criteria for managed stands: Density management treatments will meet the levels in Table 8 (page 60). If minimum diameters are not available, the agency will select trees to reach the desired level per acre from the average diameter class of the post treatment stand. Upon completion of any density management treatment in mid-seral or older stands, the coarse woody material Desired Future Condition (DFC) levels (page 60) will be met or exceeded. To advance snag levels to this particular DFC at the time of treatment completion, leave at least two credited snags per acre to be chosen from the average diameter of crop trees (on the average of 40 acre blocks). If the DFC snag level has not been left, the field units will reexamine stands within 5 years of treatment to assess obtainment of the snag DFC. If the stands are deficit in snags, the unit will create sufficient snags chosen from the average diameter of crop trees to equal or exceed the

DFC levels.

- Density management of stands greater than 80 years old: As noted on pages 76-77, treatment of these stands would be subject to future REO review.
- <u>Disturbance risk</u>: The risk reduction section (pages 63-68) needs some additional clarification. Risk reduction activities were mentioned but were not described sufficiently to exempt most of these activities from future REO review. Prescribed natural fire is not exempted from review, nor was it the LSRA team's intent to exempt it from review. The only risk reduction treatment management activities exempt from future REO review are "treatments to reduce short-term risks."
- Treatments to reduce short-term risks: Risk reduction actions as described on pages 65-66 will target activity fuels less than 3 inches diameter following treatment activities. The short-term risk reduction activities described on pages 65 and 66 are exempted from future REO review, except for the construction of shaded fuel breaks.
- Salvage: All standing live trees, including injured trees that are likely to survive the event, will be retained. Salvage or partial salvage, as described, is not exempted from REO review.
- Tailholds and varding corridors: Recommended edit (page 87), "....occasionally adjacent land owners request permission, or Federal land managers propose, to cut individual..." This would apply where effects to the LSR are deemed insignificant relative to LSR objectives and overall resource effects are more desirable than those achievable using other access.

Conclusions

The REO finds that the LSRA, with the assumptions noted above, provides a sufficient framework and context for future projects and activities within the LSR. Subsequent to priority areas being mapped and the map being forwarded to the REO, the following projects will be exempt from future REO review: short-term risk reduction actions as described on pages 65-66 which target activity fuels less than 3 inches diameter following treatment activities, except for the construction of shaded fuel breaks; silvicultural activities that meet the criteria in the REO memoranda "REO Review Exemption Criteria" (April 20, 1995) or "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" (July 9, 1996) as modified by a September 30, 1996 amendment. Your LSRA is being retained in the REO for our files.

The REO is working with the Research and Monitoring Group (RMG) to ensure that projects within LSRs including projects exempted from future REO review, are considered in the development of the Implementation, Effectiveness, and Validation Monitoring Programs.

cc:

REO, RIEC, LSR Team
Umpqua Forest Supervisor, Don Ostby
Medford BLM District Manager, Ron Wenker
Roseburg BLM District Manager, Cary Osterhaus
Lisa Freedman, FS

1365/ly

South Umpqua River/Galesville Late-Successional Reserve Assessment (LSR # RO223)

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South Umpqua River/Galesville Late-Successional Reserve Assessment (LSR # RO223)

Summary

This Late-Successional Reserve (LSR) assessment was prepared as directed by the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management

Planning Documents within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. The physical and biological features which contribute to late-successional forest habitat characteristics were assessed with the intent of providing federal land managers with information for making site specific decisions. This LSR Assessment has been reviewed by the Regional Ecosystem Office (REO) and this Assessment has been modified to reflect the assumptions and clarifications made by the REO in their review memorandum dated July 2, 1999.

Management objectives of Late-Successional Reserves are to maintain and promote a functional and interacting late-successional and old-growth forest ecosystem. Late-Successional Reserves are designed to provide the following purposes: 1) provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid eliminating future management options, 2) provide habitat for populations of species that are associated with late-successional forest, 3) help ensure that late-successional species diversity will be conserved, and 4) provide a component of the Aquatic Conservation Strategy offering core areas of high quality stream habitat.

This assessment covers the South Umpqua River/Galesville Late-Successional Reserve (LSR #RO223) and the 100 acre known spotted owl activity centers and unmapped LSRs within 10 miles of the LSR and within the same vegetation zones identified in this LSR Assessment. These are managed by the Roseburg and Medford BLM Districts and the Umpqua National Forest. Also included is Roseburg BLM's District Defined Reserve (DDR), which is to be managed as LSR, for a total of 66,903 acres of federal managed land. There is an additional 37,234 acres of non-federal lands intermingled with the federal LSR lands.

The known spotted owl activity centers and protection buffer species sites (unmapped LSRs) occur in the surrounding matrix lands outside the South Umpqua River/Galesville LSR. These areas also contribute to dispersal habitat between the larger LSRs. Activities within these LSRs would comply with the management guidelines contained in this assessment. They will be managed to maintain the existing late-successional and old-growth conditions.

Watershed analysis has been completed for the various watersheds that contain this LSR. These watershed analyses can be consulted for more information and Aquatic Conservation Strategy recommendations. The northeast portion of the LSR is within the South Umpqua

Tier 1 Key Watershed. This LSR together with riparian reserves in the surrounding matrix, owl core areas and connectivity/diversity blocks work together to provide east-west connectivity.

This LSR lies in a critical East-West connectivity area between two large valley systems. To the south is the Rogue River valley and to the north is the Umpqua valley. North and south of this LSR there are essentially no neighboring LSRs. The LSR is located at the south end of the Umpqua valley in a landscape dominated by intermingled BLM and private lands. To the east and southeast of the LSR there is block Forest Service lands. The lack of federal ownership across the I-5 corridor in most of western Oregon points to this area as a vital link between major physiographic provinces.

The northern portion of the LSR, because of topography, the pattern of land management, and existing stands, is key to providing connectivity. For this reason a connectivity corridor with certain restrictions on treatments is recommended for a portion of the checkerboarded Roseburg District. Stand level connectivity would be maintained following treatment in this corridor of BLM lands. Therefore, in addition to the LSR's primary objective of providing a reservoir or refuge for late-successional and old-growth associated species, its geographic location within a corridor of BLM managed lands would serve to strengthen the connectivity function between the Coast Range Province and the Cascade Province.

The checkerboard ownership prevents attaining contiguous blocks of late-successional forest in most of the LSR. Late-successional habitat generally exists as relatively small blocks (<200 acres) fairly evenly distributed across the LSR. For this reason, connectivity within the LSR varies. In some areas, large stands or entire sections of late-successional stands are adjacent or in relatively close proximity to other late-successional stands. In other areas, connectivity is not as good because late-successional forest stands are separated by large areas of early seral stands. On the landscape, these isolated pieces act like small islands of late-successional stands surrounded by early seral age class stands. Reasons for this isolation include the checkerboard ownership of BLM lands and private holdings, past timber harvesting practices, and natural disturbances (mainly fire).

Vegetative conditions, past and present, have been influenced by environmental and human factors. Late-successional stands are estimated to have covered from 40 to 75 percent of Southwestern Oregon, historically (USDA 1993). For this LSR, approximately 43 percent of the federal lands are in late-successional stands. The objective for management in this LSR will be to attain and maintain 60 to 75% of the federal lands in late-successional stands.

Present vegetative communities have been placed into six vegetation zones based on the dominant late seral conifer species. The plant communities are influenced by elevation, aspect, and soil types. Old-growth definitions and desired future conditions for the Douglas-fir/chinkapin and tanoak vegetation zones are provided by Bingham and Sawyer (1991). The other zones are characterized by definitions from the Old-growth Definition Task Group (1986) and also reflect the desired future conditions

The Forest Ecosystem Management Assessment Team (FEMAT) report identified approximately 1,100 species (not counting arthropods) as closely associated with late-successional forests. Because of the abundant information about the northern spotted owl and its association with late-successional forests, this assessment tends to focus on the spotted owl and how activities in the LSR may affect the spotted owl.

The northern portion of the LSR includes two elk management areas identified in the Roseburg District RMP/ROD (1995). We will manage for LSR objectives that may conflict with the variety of habitats that elk need.

Appropriate treatments within the LSR can be divided into four categories: salvage, risk reduction, silviculture actions for attainment of late-successional habitat conditions, and other non-silvicultural activities. All management activities should be designed to accelerate or not to impede the development of late-successional forest conditions.

Three general landscape criteria were identified for setting priorities for the location of future treatment areas:

- 1) Maintaining or enhancing connectivity across the landscape,
- 2) Establishing large blocks of late-successional habitat,
- 3) Enhancing suitable spotted owl habitat conditions around centers of activity A few areas may be high priority for treatment because they meet more than one of the identified needs. These areas are the Bland Mountain fire area of the Roseburg BLM, the central portion of the Medford BLM, owl sites below 30 percent suitable habitat, and any early seral stand created by timber harvest.

Salvage would generally not occur in areas of less than 10 acres or where canopy closure is greater than 40 percent. The possible exception would be if the disturbance created an opening that was substantially connected to a recent, previous opening or if a risk reduction evaluation indicated a need to salvage. Individual or groups of trees along roads, trails, or recreation sites may be salvaged if they pose a hazard to people using the area. Areas greater that 10 acres or less than 40 percent canopy closure may be considered for salvage. An interdisciplinary team would evaluate all salvage opportunities. Salvage, or partial salvage, would be subject to REO review.

The risk of large-scale habitat loss from a wildfire event occurring within this LSR is relatively high. The historic fire return level for the LSR is on the order of 30-80 years. All wildfires within the BLM portion of the LSR would be suppressed. Prescribed natural fire would be an option for Forest Service lands, and would be subject to REO review. However, prescribed fire is recognized as a valuable tool to meet LSR objectives, especially in southwest Oregon where fire is such an integral part of ecosystem functions. The primary objective of fire and fuels management in the LSR is to minimize loss of late-successional habitat by reducing the risks of high intensity, stand replacing wildfires. Treatments described in this assessment to reduce short-term risks associated with fuels are exempt from future REO review. Treatments to reduce long-term risks remain subject to REO review.

The objective of silvicultural systems proposed for the LSR would be to develop old-growth characteristics including snags, down logs, large trees, canopy gaps, multiple layers, and diverse species composition. Silviculture treatments, such as reforestation, release, density management, pruning, fertilization, and tree culturing to accelerate the development of desired characteristics could occur within the LSR. The stocking and structure of existing managed stands were to produce high yields of timber, not to provide for old-growth forests. Stand management would focus on stands that have been regenerated following timber harvest or stands that have been thinned. Stand management could also occur on unmanaged stands that are even aged and lack structure. Approximate treatment acres for silvicultural projects and management priorities for the next ten years are given. Coarse woody material and snag criteria for managed stands following density management have been provided.

Nonsilvicultural activities in the LSR that are neutral or beneficial to the creation and maintenance of late-successional habitat are allowed. Most of the nonsilvicultural activities are expected to have neutral or beneficial effects on late-successional habitat. One example is a stream restoration project proposed in the Stouts Creek watershed within the Bland Mountain fire area. Multiple-use activities other than silvicultural activities that may have potentially adverse impacts to the creation and maintenance of late-successional habitat must be reviewed by the Regional Ecosystem Office (REO) if adjustments in standards and guidelines are going to be made (ROD p. C-16). Any quarry development activities would be subject to REO review and approval. There is also a proposal for construction of a campground adjacent to Galesville Reservoir. While development of a campground may seem inconsistent with LSR objectives, it would focus the dispersed recreational use currently existing in the area.

This LSR Assessment provides a framework and context for making future decisions on projects and activities.

South Umpqua River/Galesville Late-Successional Reserve Assessment (LSR # RO223)

I. Introduction

This Late-Successional Reserve (LSR) assessment was prepared as directed by the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management

Planning Documents Within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, or Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management 1994) and the Record of Decision/Resource Management Plans (ROD/RMP) for the Medford and Roseburg Bureau of Land Management (BLM) Districts. It is also subject to the Umpqua National Forest Land and Resource Management Plan. These documents state that a management assessment should be prepared for each Late-Successional Reserve (or group of smaller Late-Successional Reserves) before habitat manipulation activities are designed and implemented.

This LSR Assessment provides information to help Federal land managers make site specific project decisions. This assessment is not a decision making document. It is a basis for developing and prioritizing site specific proposals and determining monitoring and restoration needs for this Late-Successional Reserve. This LSR Assessment has been reviewed by the Regional Ecosystem Office (REO) and this Assessment has been modified to reflect the assumptions and clarifications made in their review memorandum dated July 2, 1999.

Late-Successional Reserves are to be managed to maintain and promote a functional and interacting late-successional and old-growth forest ecosystem. Late-Successional Reserves represent a network of existing old-growth forests that are retained in their natural condition where natural processes are allowed to function to the extent possible. Late-Successional Reserves are designed to provide the following purposes: 1) provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid eliminating future management options, 2) provide habitat for populations of species that are associated with late-successional forests, 3) help ensure that late-successional species diversity will be conserved, and 4) provide a component of the Aquatic Conservation Strategy offering core areas of high quality stream habitat. The objective of silvicultural systems proposed for the LSR would be to develop old-growth characteristics including snags, down logs, large trees, canopy gaps, multiple layers, and diverse species composition. The objectives of this document are to assess the physical and biological features which contribute to late-successional forest habitat characteristics and to provide a context for managing the LSR to maintain and promote late-successional habitat.

This LSR has been discussed in Watershed Analysis (WA) documents prepared by the BLM and Forest Service. These include the Middle Cow and Upper Cow WA completed by the Glendale Field Office, Medford District, BLM; the Stouts/Poole/Shively-O'Shea WA prepared

by the South River Field Office, Roseburg District, BLM; and the Cow Creek WA and Elk Creek WA by the Tiller Ranger District, Umpqua National Forest.

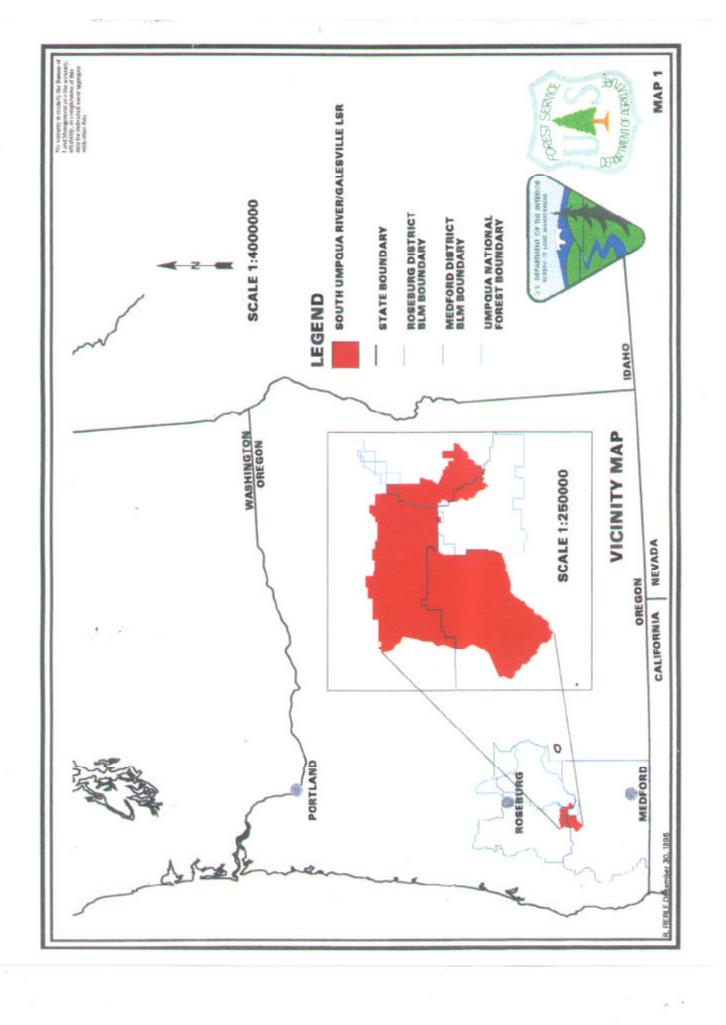
Characterization of the LSR

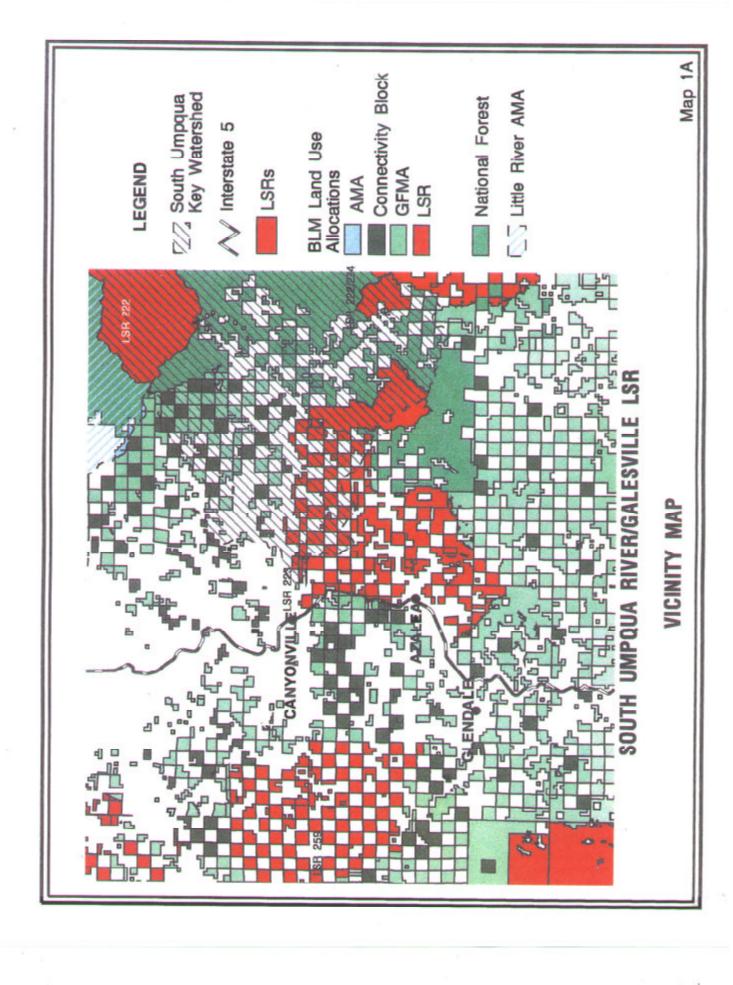
The South Umpqua River/Galesville Late-Successional Reserve (LSR #RO223) is located in the Oregon Klamath Physiographic Province in southwest Oregon. It is roughly located between Glendale, Canyonville, and Tiller, Oregon, east of Interstate 5 and south of the South Umpqua River (see Map 1). The LSR encompasses 66,173 acres of Federally managed lands. An additional 730 acres in the South River Field Office of the Roseburg BLM is designated as District Defined Reserve (DDR) which are to be managed as LSR. This assessment incorporates LSR and DDR land use allocations totaling 66,903 acres. The acres for Riparian Reserves are included within this LSR assessment. Where Riparian Reserves occur within the LSR, the standards and guidelines of both designations apply. Standards and guidelines apply for allocations where they are more restrictive or provide greater benefits to late-successional forest related species.

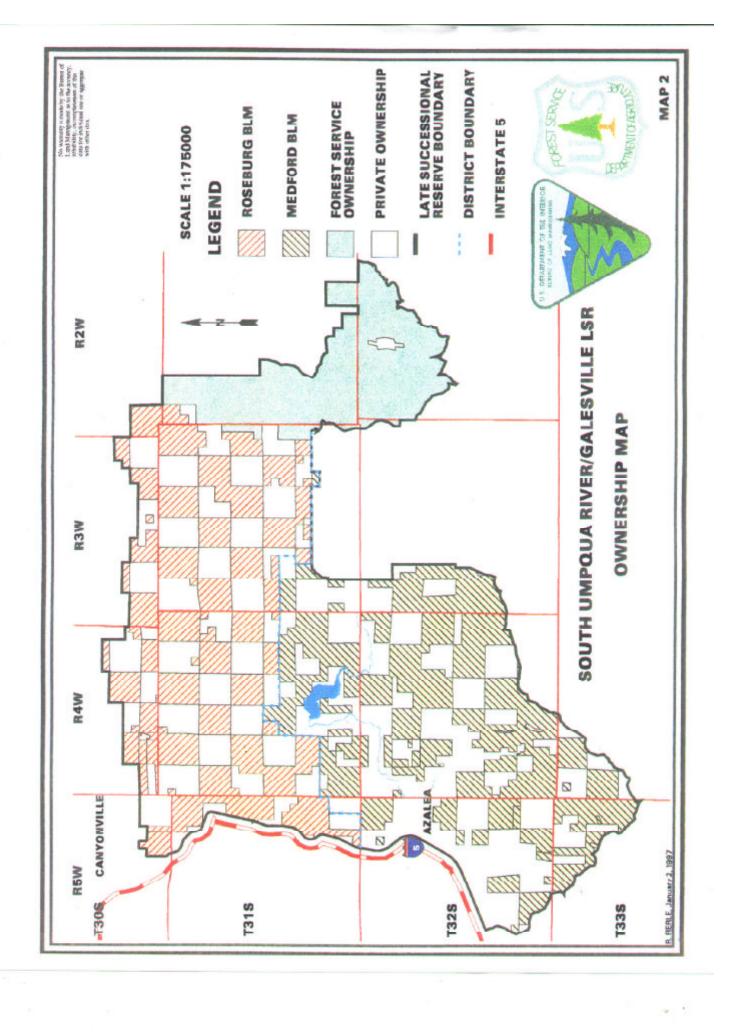
Known spotted owl activity centers (100 acre owl core areas) and protection buffer species sites occur as unmapped LSRs in the surrounding matrix lands outside the South Umpqua River/Galesville LSR. The 100 acre known spotted owl activity centers and the protection buffer sites included in this LSR Assessment are those that are within 10 miles of the mapped LSR and in the same vegetation zones identified and described in this Assessment. These areas also contribute to dispersal habitat between the larger LSRs. Because the 100 acre LSRs were designated in the best northern spotted owl habitat as close to the nest site or activity center as possible, these LSRs are composed primarily of late-successional habitat. Small amounts of mid and early seral habitats occur in some unmapped LSRs. Activities within these unmapped LSRs would comply with the management guidelines contained in this assessment. They will be managed to maintain the existing late-successional and old-growth conditions. The likelihood of any management actions proposed within the activity centers is extremely low.

Federal and non-Federal ownership is intermingled in a "checkerboard" pattern characteristic of Revested Oregon and California Railroad Lands (O&C) in western Oregon. Forest Service administered lands are in a block of ownership with small areas of privately owned lands intermingled. There are approximately 37,234 acres of non-Federal lands intermingled with the Federal LSR lands. Ownership is summarized in Table 8 and shown on Map 2.

The upper South Umpqua River Basin has been designated in the ROD as a Tier 1 Key Watershed. The Key Watershed designation overlays land use allocations and contributes directly to the conservation of at-risk salmonids. Key watersheds are the highest priority for watershed restoration. The portion of the LSR in Stouts Creek, Poole Creek, Shively-O'Shea, and Elk Creek Watersheds is included in this Tier 1 Key Watershed. Approximately 33,639 acres of the LSR is located within this key watershed. The Roseburg BLM administers 21,369 acres and 12,270 acres are administered by the Tiller Ranger District.







The LSR and the Landscape

This LSR is situated on the landscape so that it depends on surrounding lands to fully function. See Map 1A for a vicinity map. The Connectivity/Diversity Blocks of the BLM Matrix lands, unmapped LSRs, as well as riparian reserves of surrounding federal lands, contribute to the function of and strengthen the LSR.

Interstate-5 (I-5) forms the western boundary of the LSR. Along the northwest and southwest edges of the LSR, I-5 goes through fairly wide valleys where private lands dominate and the major land uses are agriculture and residential areas. Between these valleys, where the LSR lies, I-5 runs through a narrow, forested canyon made up of checkerboard BLM lands.

As a result of the location between these two large valley systems the South Umpqua River/Galesville LSR lies in a critical East-West connectivity area. The United States Fish and Wildlife Service (USFWS) identified this area as a primary "Area of Concern" for the northern spotted owl in providing for east-west flows between the Cascade, Siskiyou, and Coast Range Mountains (Federal Register 1991). The link is made even more significant by the presence of I-5 as a barrier to movement. The highway corridor is not considered a barrier to spotted owls, but would be to less mobile terrestrial animals that have to cross the corridor on the ground. It is important to maintain genetic flow between reserves and the lack of federal ownership across the I-5 corridor in most of western Oregon points to this area as a vital link between major physiographic provinces. Therefore, in addition to the LSR's primary objective of providing a reservoir or refuge for late-successional and old-growth associated species, its geographic location within a corridor of BLM managed lands serves to strengthen the connectivity function between the Coast Range Province and the Cascade Province.

The Federal lands surrounding the LSR are designated as Matrix and intermingled with private lands in a checkerboard pattern. Similar to the situation within the LSR, virtually all of the private timber lands in these areas have been harvested and are dominated by recent clearcuts, hardwood stands, or second growth conifer forests 25-40 years old.

The Forest Service does manage a contiguous block south of the eastern portion of the LSR. These lands are also designated as Matrix and are currently a mix of late-successional forests and recent clearcuts. East of the LSR there is a band of intermingled Forest Service and private timber lands, then a large block of Forest Service ownership at the higher elevations in the Cascades.

The closest neighboring LSR is approximately four miles east of the South Umpqua River/Galesville LSR, administered by the Umpqua National Forest (LSR #222). This adjoins the Medford District BLM LSR #224. These LSRs are part of a network of LSRs running North/South along the Cascades which is virtually uninterrupted. To the west, across the I-5 corridor the closest LSR is approximately 12 miles west in the Roseburg District BLM (LSR #259). The connectivity between this LSR and the LSR to the west is much more tenuous than to the east. Connectivity/Diversity Blocks within the matrix lands to the west strengthen

the tie.

North and south of the South Umpqua River/Galesville LSR there are essentially no neighboring LSRs. To the south is an area of intermingled BLM and private timber lands and then the large Rogue River valley in which Grants Pass and Medford are located. Similarly, to the north lies intermingled BLM and private timber lands and then the large Umpqua valley where Roseburg is located.

The watersheds directly north and northeast of the LSR are included within the upper South Umpqua River Tier One Key Watershed. (See Map 1A)

Connectivity

Connectivity is defined as a measure of the extent to which conditions between late-successional forest areas provide habitat for dispersal, movement, feeding and breeding of late-successional associated terrestrial and aquatic species. Connectivity does not necessarily mean that late-successional areas are physically joined since many late-successional species can move or can be carried across areas that are not in late-successional conditions. Landscape features affecting connectivity of late-successional ecosystems are: distance between late-successional areas, and forest conditions between late-successional areas.

The South Umpqua River/Galesville LSR, along with riparian reserves in the surrounding federal lands, unmapped LSRs, and Connectivity/Diversity Blocks work together to provide east-west connectivity between the LSRs in the southern Cascades and Coast Range. The Connectivity/Diversity blocks are scattered across the landscape in the Medford and Roseburg BLM Districts. These Blocks were selected to give greater connectivity across the landscape. Future management is designed to maintain 25-30% of each block in late-successional forest, retain 12-18 trees per acre in regeneration harvests, and manage on a 150 year rotation. In some areas, the late successional stands within these blocks are on withdrawn lands so harvest of these sites is not planned. Riparian Reserves between the LSRs provide some degree of east-west connectivity. While some currently function as late successional forests, many do not as a result of past timber harvest. Connectivity will improve as these areas develop late successional characteristics. Owl Core areas, as well as, unmapped managed LSRs also contribute to east-west connectivity.

Within this LSR connectivity varies. In some areas large stands or entire sections of late-successional stands are adjacent or in relatively close proximity to other late-successional stands. Connectivity of late-successional stands is better where federally managed lands share boundaries or section corners. In other areas connectivity is not as good because late-successional forest stands are separated by large areas of early seral stands. On the landscape, these isolated pieces act like small islands of late-successional stands surrounded by early seral age class stands.

An overview of the LSR (see Map 8, page 29) indicates that more functional connectivity,

due to larger blocks of late-successional habitat in relatively close proximity to each other, occurs across the northern portion of the LSR. On the east side of the LSR the block ownership pattern of the Forest Service shows a more contiguous late-successional forest area that connects on the western side to three BLM sections with late-successional stands. Other sections with late-successional forest blocks are present in the southwestern portion of the LSR, but they tend to be fragmented and not well connected. Concentrations of early seral age stands adjacent to, in the vicinity of, or with the possibility of connecting these blocks could be considered for silvicultural manipulation to accelerate the development of late-successional stands.

Connectivity within portions of the LSR is currently very poor due to isolation of late-successional forests from other similar stands. Reasons for this isolation include the checkerboard ownership pattern of BLM lands, private land holdings within Federally administered lands, effects of past timber harvesting practices, natural disturbances (mainly fire), and geologic and geographic influences.

Fragmentation

The checkerboard ownership within the LSR prevents attaining large contiguous blocks of late-successional forest except on Forest Service lands. Because of the checkerboard ownership, with the private lands intensively managed for timber production, there is an inherent fragmentation in existing late-successional habitat which will continue in the future. The vast majority of private lands are less than 80 years old now and would be expected to remain in these early and mid-seral age classes. The Forest Service has the greatest potential for producing larger blocks of late-successional habitat and interior habitat with the continuous ownership in that portion of the LSR.

On Federally managed lands, past management, primarily logging and road building, has resulted in fragmentation and loss of late-successional habitat. Wildfires also have contributed to fragmentation. With a relatively high fire return interval of 30-80 years, fire will continue to be a major disturbance factor. The recent Bland Mountain fire accentuates this point. Natural features, such as meadows and serpentine openings, fragment the area to a lesser extent.

Late-successional habitat exists as relatively small blocks (<200 acres) fairly evenly distributed across the LSR. A preliminary look at the block size in the LSR indicates the vast majority of late-successional patches are less than 50 acres and only three blocks are over 500 acres. For this LSR, the scarcity of large areas of late seral and old-growth habitats are a major area of concern. Small block sizes are generally inadequate to provide for those species which need interior habitat to survive. Interior habitat is defined as late-successional and old-growth habitat at least 400 feet from the edge with an adjacent stand younger than 80 years old. Interior habitats are greatly limited in this LSR because of the block sizes, even though over 40 percent of the federal lands are in late-successional condition.

Sections currently with small fragmented pieces have future potential of becoming a solid block of late-successional forest. Such areas noticeably lacking late-successional habitat include Whitehorse and Fizzleout Creeks on Medford BLM and the Bland Mountain Fire on Roseburg BLM. Much of the former area has been classified as suitable spotted owl habitat, but is too young to qualify as good late-successional habitat.

II. Past Uses

Archaeological evidence of human habitation in southwest Oregon stretches back at least 10,000 years. The first inhabitants seemed to live in small, mobile groups, hunting and gathering throughout a defined territory.

Approximately 3,000 years ago cultural patterns began to change. Population growth, permanent villages, long-distance trade in luxury items, the appearance of wealth items and the development of social classes characterize this later period. This was a time of increasingly intensive use of natural resources as well as an increasing focus on the aquatic resources of the rivers. Permanent settlements appeared along the major rivers, such as the South Umpqua River, and their tributaries.

The first Euro-American arrived in the area in the early 1800's. The Hudson Bay Company fur traders aggressively trapped beaver and other fur-bearing animals in an effort to eliminate them, and in effect to eliminate competition from American trappers. Between 1820 and 1850 explorers, scientists, pioneers, and adventurers passed through the region collecting information and/or travelling to either the Willamette Valley or California.

The discovery of gold in the Rogue Valley brought a large influx of people to the area. Placer and lode mining for gold, silver, copper, mercury, and nickel were the primary minerals mined.

Federal policies beginning with the Donation Land Claim Act of 1850 and subsequent homestead acts encouraged settlement. Ranching and farming complemented the more transient mining industry. Small communities developed and grew, aided by the building of the railroad along Cow Creek in the 1880s. Rail transportation stimulated logging in the valleys.

The early decades of the twentieth century witnessed the continuation of economic trends of earlier years. Mining, ranching, farming, and logging continued to be major industries and uses in the area now defined as the LSR. Growing concerns over conservation issues led to the creation of the Forest Service. Federal land policies, such as fire suppression, began to affect the LSR.

A subsistence way of life, which was similar to earlier native ways of life, developed and persisted through the Depression era of the 1930's. It was characterized by low cash flow and

a dependence on hard work to produce the necessities of life. Residents built their own homes; gathered, hunted, fished, and preserved much of their own food; traded and bartered for other necessities; and earned limited amounts of cash from a variety of tasks. These activities relied to a great extent on the natural resources in the area.

The Depression era also brought the Civilian Conservation Corps to the area. These young men built roads and bridges, and engaged in fire suppression and other land conservation work. As a result of their efforts, formerly inaccessible areas in the forested mountains were opened. The new roads and bridges expedited the harvesting of timber.

After World War II population growth, better roads and cars, and increased tourism has allowed more people access to the LSR for a variety of reasons. Also, improvements in transportation, especially the availability of heavy duty trucks and equipment for road construction, and the increased demand for lumber has increased timber harvesting within the LSR.

Historic Vegetative Conditions

Late-successional stands are estimated to have covered from 40 to 75 percent of Southwestern Oregon, historically (USDA 1993). Native patterns of vegetation, extant at the time of European exploration and settlement, were the result of both natural and human influences. Native human influences included cutting and cultivation of key materials, such as basketry materials; weeding and tilling of certain plant communities; and the use of fire for many different purposes. Extensive use of fire is documented in the accounts of early explorers, trappers, and pioneers. An in-depth historical perspective of human influenced changes has been completed for the Cow Creek Basin (unpublished manuscript on file at the Medford BLM District office).

The effects of Native American burning were to keep valley and foothill areas open and covered in native grasses. Fire also promoted the existence of oak-pine savannahs, throughout the valleys and foothills, and chaparral plant communities. At higher elevations, fire, both natural and human-caused, kept upland meadows open and productive of plant foods and browse for deer and elk, and kept ridge systems open for travel. Early Euro-American travelers remarked consistently on the lush prairies of the lowlands, tall timber of the foothills and mountains, and abundant wildlife.

When early explorers, trappers, and pioneers entered the area they immediately began altering the native landscape. Before 1850, trappers cleared beaver out of local streams, affecting the riparian areas through the loss of these animals. Miners altered stream terraces through hydraulic mining, and settlers soon changed the character of the valleys and foothills by introducing agriculture, foreign plants and animals, and by cutting timber.

Agricultural activities and stock raising immediately affected the native vegetation. Valley bottom prairies and meadows were transformed to agricultural fields and orchards, native

species in the grasslands were diminished and new species introduced. The settlers built houses and wooden fences around their farms, and discouraged the native practices of burning the landscapes. Farmers' hogs and livestock grazed and rooted through the native grasslands and camas fields, destroying the camas and changing the character of the grasslands.

The coming of the railroad in the 1880s stimulated the logging industry in the valleys. Numerous small sawmills operated at lower elevations up creeks and streams. Splash dams and water diversion ditches affected streams and riparian vegetation.

By the turn of the century, much of the native vegetation of the valleys and foothills had been transformed through the introduction of agriculture and exotic species, ranching, and timber harvest. Riparian areas had been affected by the removal of beaver, and by mining and logging practices.

After World War II, advances in road building and transportation opened up the higher elevations to extensive timber harvest. New intensive forestry practices also began to change the character of the forests.

III. Current Conditions of the LSR

The area has a temperate marine climate with warm summers and mild, wet winters. The rainfall in the area varies from about 45 to 60 inches, falling mainly during the winter. Elevation, aspect, geology, and distance from the Pacific Ocean greatly influence the plant communities.

The geology of the LSR is quite complex. The dominant geologic pattern is alternating bands of metasedimentary and metavolcanic formations of Jurassic age. The eastern portion of the LSR is composed of a large area of granitic textured igneous rocks. Several seams of serpentine and peridotite derived rock formations appear in the metavolcanic formations. Geologic units including Triassic Applegate Group metasediments and metabasalts and Late Jurassic sediments of the Dothan and Otter Point Formations occur to a lesser degree. Vegetative communities have developed on the soils weathered from these geologic formations at differing rates and species composition based upon the mineral content of the native rock, available moisture, and soil depth.

Fire and Disturbance Risk

Fire has been a significant, if not the dominant factor in maintaining the compositional and structural diversity of the area, as well as fragmenting the late-successional forests. Intensity of fires has varied based on elevation, aspect and vegetation zones. Forests of all vegetation zones have burned, though the return intervals have been different. The zones in the lower elevations probably had more frequent fires than the Douglas-fir and other conifer dominated types at higher elevations. Not only were the fuel characteristics more conducive to frequent fires, but the lower elevations probably received more frequent human-caused fires as Native Americans burned the valleys and foothills for their own uses. Fire exclusion and continued suppression of fires became effective around the 1940's. Fire exclusion has resulted in the development of stands that would not have occurred naturally. In some stands, shade tolerant understories have seeded in that would have otherwise been kept out by frequent low intensity fires. This is particularly so at the higher elevation zones where white fir has become a more common understory species.

For this LSR it appears that the "historic" fire return interval was on the order of 30-80 years (Agee 1993). It appears that fires were probably more frequent and more intense in the hot, low elevation areas and on south slopes than at higher elevations where conditions are more moist.

Risk of large-scale habitat loss from a wildfire event occurring within this LSR is relatively high. Fuels and ignition sources are present. The ROD recognizes that the Oregon Klamath Physiographic Province has an increased fire risk due to lower moisture conditions and rapid accumulation of fuels after insect outbreaks and drought. Fire suppression and exclusion have caused fuels to accumulate to a point that they are outside the range of "historic" variability. Many stands are currently overstocked with conifers, hardwoods, and shrubs.

Fuel ladders within these stands are well established. Much of the private timberland, particularly small ownerships near the valley floor, has been recently harvested. Typically, very little slash disposal was done on these lands. Fine fuel levels are the primary concern. Until decomposition occurs, this hazard will remain. Silvicultural activities such as density management, release, and maintenance brushing have added to the fuel loadings. Fuels generated from these activities have generally been untreated.

In addition to increased fuels, there are numerous sources of ignition. There are a number of residences, the LSR is used for recreational purposes such as dispersed camping and hunting, especially in the Galesville Reservoir area, there is an extensive road system, and there is active forest management (logging and silvicultural operations). Lightning has been the primary ignition source historically. Because this LSR has relatively short fire return intervals, there is a concern that maintaining existing connectivity and late-successional habitat while developing other stands with these characteristics and maintaining them over the long-term will be difficult. Stands with short fire return intervals (southerly aspects) are generally at greatest risk of loss.

Characteristics of fires in the LSR are changing. Fires before the advent of intensive fire suppression tended to be lower-intensity and more frequent. Fire suppression (as well as treatments) have caused fuels to build up so that fires now tend to be higher-intensity and less frequent. High intensity fires are a greater risk for late-successional habitat loss. The 1987 Bland Mountain fire is a recent example of a high intensity stand replacement fire. This fire originated north of the LSR. It jumped the South Umpqua River into the LSR, swept through the eastern portion of the Poole Creek watershed, and into the Stouts Creek watershed. The fire consumed 10,000 acres in nine hours.

Other Disturbance Risk

Risk of large-scale habitat loss from other disturbance events is relatively low. Loss of late-successional habitat to disease over large areas is not presently a concern. Diseases within most stands are generally at or near endemic levels and provide for many of the desired characteristics of older forests such as occasional snags, stem decay, and recycling of nutrients. Disease can however, be an important concern for individual species and potentially may be a concern on a stand by stand basis.

White pine blister rust, *Cronartium ribicola*, is present in the LSR. Maintaining a component of sugar pine or white pine in stands is greatly influenced by the rust. It causes considerable mortality of sapling and pole size trees. While it may not kill large trees by itself, it predisposes the trees to mountain pine beetles. Larger trees in heavily stocked stands are vulnerable and often killed by the pine beetles.

While not currently a major concern, laminated root rot, *Phellinus weirii* is present within the LSR. It has been identified in the E1/2, SW1/4 T.32S., R.5W., section 13. Blackstain, *Ophiostoma wageneri*, is present within the LSR. Several dwarf mistletoes of conifers have been identified within the LSR. The Snow Creek area has concentrations of dwarf mistletoe large enough that there is a concern to stand management, especially understory establishment

under an infected overstory.

Insect activity within stands is generally at or near endemic levels. In some areas, however, stand characteristics are slowly changing. Larger conifers, particularly the pine, are dying out of stands. While insects are often involved, they are usually secondary, with stress from overcrowded stands causing of loss of vigor, or associated with blister rust as mentioned above. In stands with limited initial numbers of ponderosa and sugar pine, loss of a few individual trees may substantially affect stand function and diversity.

While windstorms have not been a major disturbance factor in this LSR, windthrown trees do occur and can be locally significant. The greatest concern for windthrown trees lies in the eastern part of the LSR on lands managed by the Forest Service. Risk of late-successional habitat loss from other disturbance events exists but is not considered notable at this time.

Noxious weeds such as Scotch Broom are present in the LSR. At this time it is unknown what effect noxious weeds and other introduced plant species will have on the attainment of LSR objectives.

Vegetation Zones

The Natural Resources Conservation Service identified vegetation zones for the Douglas Area Soil Survey based on years of plot sampling and reconnaissance of the area. These have been used to characterize the vegetation within the LSR. A vegetation zone may cover large areas but always has a single set of potential native plant communities repeated throughout the zone. The patterns are predictable since they are related to local landscape features such as aspect, soil, and landform. Microclimate should be relatively similar throughout a given zone.

Six vegetation zones were identified within the LSR (see Map 2A, page 17):

Western Hemlock zone

Approximately 40% of the LSR falls into the western hemlock zone. It occurs in the northeastern portion of the LSR. Precipitation amounts are in the upper end of the range for the LSR. Douglas-fir is the dominant species in the stands. Western hemlock is a significant understory species or overstory dominant in older stands on north aspects throughout the zone. It may be present in minor amounts on south slopes. Grand fir is often an understory or overstory component. Western red cedar and chinkapin also occur. Red alder and big leaf maple are also hardwoods that occur in favorable locations. Understory species include sword fern, oxalis, vine maple, salal, hazel, oceanspray, rhododendron, and Oregon grape.

Douglas-fir/Chinkapin zone

This vegetation zone in the LSR represents the tip of a zone that extends further south into Jackson and Josephine counties. This zone makes up about 35% of the LSR. It occurs in the western portion of the LSR and transitions into the Western Hemlock zone

to the east. Douglas-fir is the dominate climax species on all typical upland slopes except for areas of shallow soils and soils with high amounts of rock fragments where Oregon white oak, canyon live oak, or drought resistant shrubs occur. On south slopes, Douglas-fir may be joined by madrone, canyon live oak, ponderosa pine, or incense cedar. Inclusions of western hemlock occur on the more favorable (moist) sites. Grand fir is generally absent in the uplands but occurs frequently in the valleys, such as in the Glendale-Azalea area. This is not typical of the zone however and probably represents a transition from the grand fir zone.

Cool Douglas-fir/Hemlock zone

This zone generally occurs above 3,000 feet elevation where much of the annual precipitation comes as snow. It makes up about 15% of the LSR. Western redcedar, incense cedar, sugar pine, and white fir also occur. Canyon live oak is found on soils with high amounts of rock fragments. Rhododendron, Oregon grape, salal, chinkapin, and red huckleberry occur in the understory.

Grand Fir zone

North of the western hemlock zone along the South Umpqua River, the LSR transitions into the grand fir zone. This zone makes up only about 5% of the LSR. Douglas-fir dominates the older stands with grand fir common on the northern slopes and absent or minor on the south slopes. Chinkapin is common on north aspects, with madrone on the south aspects. Incense cedar is often present. The zone is generally to dry for western hemlock except in more favorable positions. Grasses and poison oak become more abundant in the understory on south aspects.

Cold Douglas-fir zone

This zone occurs on the highest elevation ridges around 4,000 feet elevation. It occupies about 3% of the LSR. Douglas-fir, western hemlock, and white fir are the common overstory species.

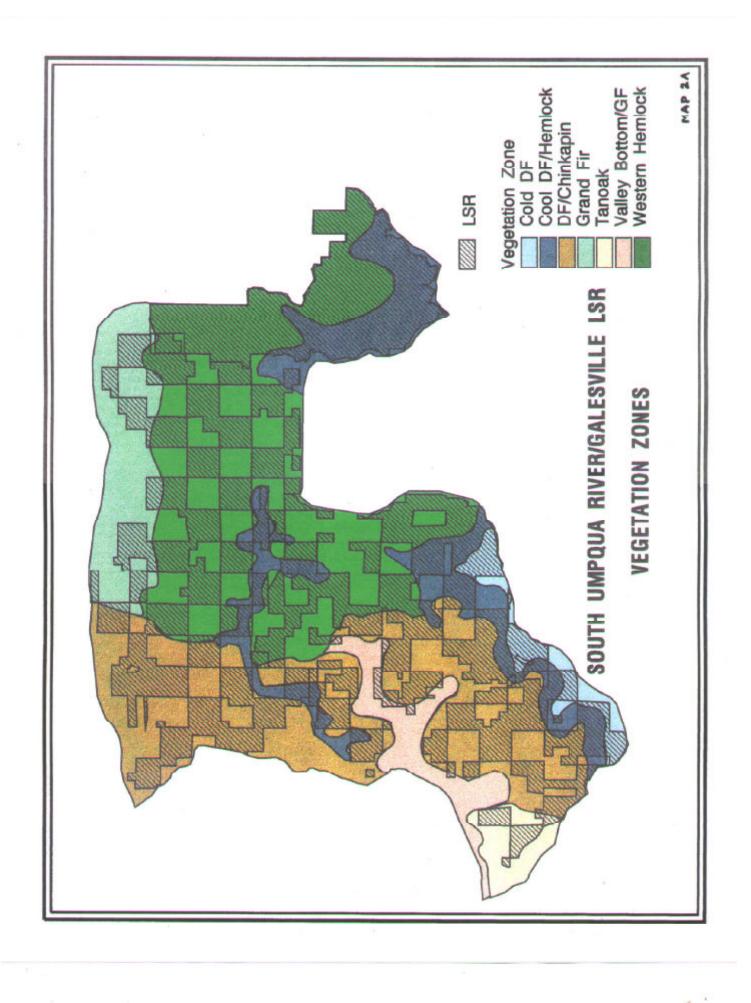
Tanoak zone

This zone occurs in the southwest portion of the LSR and occupies only about 2% of the LSR. This represents just the tip of the tanoak zone that extends further south. Douglasfir is the dominant species along with tree form tan oak on the north aspects and shrub form tanoak on the south aspects. It is similar to the grand fir zone with the exception of tanoak.

Nonforest

Vegetation communities associated with meadows, rock outcrops, rock cliffs, or talus slopes occur within each of the defined major plant groupings. These communities cover approximately 2% of the Federal lands within the LSR. Meadow habitat is very limited in distribution within the LSR. Sites dominated by rock are common within the upper reaches of the Cow Creek drainage. Special status plant species are most likely to occur in these unique habitats.

Riparian areas are extensive throughout the LSR. Forested riparian zones are generally more complex than adjoining plant communities. The diversity of vegetation ranges from plants submerged in water to species common in upland plant communities. Annual and perennial plants, as well as tree species mix, are likely to be more diverse than adjacent upland forests. A higher occurrence of bigleaf maple, red alder, willow, and vine maple is likely in riparian areas. Pacific yew is minimally represented within the riparian zones. Western hemlock is more prevalent in the upper reaches of the streams.



Seral Stage Distribution

In compiling vegetation data for the LSR, assumptions and aggregations were made to accommodate different types of data from BLM and Forest Service. The BLM data was derived from the Forest Operations Inventory (FOI) and the Timber Productivity Capability Classification (TPCC). Stand age, size class, stocking and canopy closure were the primary factors utilized. Vegetation on Forest Service lands was assessed using satellite imagery using the process described in the Jackson Creek Watershed Analysis, Tiller Ranger District.

Seral stage groupings and structure classes for this LSR assessment roughly follow those described in Brown (1985) using the following approximate stand ages and groupings:

Nonforest = rock, meadows, residential, agricultural, etc.

Grass/Forb/shrub = stand age approximately 0-10 years

Sapling/Pole = 11-40 years

(open to closed cover conditions)

Mid Seral = 41-80 years

Late seral = 81-200 years

Old-growth = 200 years and older

Modified older stands = stands older than 80 years which have been partial-cut or

modified in other ways (see further explanation below)

The modified older stands includes stands older than 80 years which have been partial-cut or modified in other ways so they may no longer function as late-successional habitat. The overstory has 40% or greater canopy closure of trees greater than 11 inches in diameter. The habitats provided by these stands generally resemble those provided by early seral stands except they provide a higher level of connectivity for old growth dependent species. In some instances these stands meet the requirements of suitable habitat. In contrast to sapling/pole and earlier seral stands, these stands have greater structural diversity. They may be lacking in snags or large down wood, but this would be easy to create if desired.

The modified older stands category is problematic because the stands represent a wide range of habitats and structure classes. The available inventories do not do a good job of identifying whether these stands are still functioning as late-successional habitat. Approximately 3,733 acres in this category has been identified within the LSR (Table 6 and Map 6). Obtaining a better inventory and classification of these older stands is a need for future management within this LSR.

Late-successional forests include the late seral and old-growth seral classes. The late seral

stage is the period in the life of a forest stand from culmination of mean annual increment (generally between 80 and 100 years old) to an old-growth stage. Brown used the term large sawlog to describe this seral stage. In this assessment the late seral class includes stands that are from 81 to 200 years old. Old-growth exists from approximately 200 years old until stand replacement occurs and secondary succession begins (ROD).

The relative quantities of seral stages/structure classes are displayed in Table 6. Maps 3, 4, 5, and 6 show the distribution of the seral stages. The difference between the way the Forest Service and BLM data is displayed on the maps is due to the different mapping methods utilized to obtain the vegetation data. The Forest Service data is based on imagery while the BLM is based on average stand data.

- Map 3 shows the location of all the seral stages within the LSR.
- Map 4 shows where late-successional stands are located within the LSR.
- Map 5 shows the mid and late seral stands within the LSR.
- Map 6 shows the location of the modified older stands.

Approximately 2 percent of the federal LSR lands will not support late-successional stands. For the entire LSR area, 5 percent of the lands would not support late-successional stands. This includes residential and agricultural areas as well as meadows and rock outcrops.

Approximately 43 percent of the federal lands in the LSR are in late-successional stands. On a landscape basis, considering all ownerships, approximately 30 percent of the area contains late-successional stands. This amount of late-successional habitat on federal lands in the LSR currently falls within the lower end of the historical range of 40 to 75 percent for southwestern Oregon. Since the objective for management is to maintain 60-75% of the federal lands in late-successional stands, there is an opportunity to create stand conditions in younger seral stages that would enhance late-successional development.

As shown in the following table of age class distribution, in 40 years, only 12% more federal land will grow into the late-successional seral stages. Assuming the current 43% can be maintained in late-successional habitat in light of the fire risk, the total would then be 55% after 40 years. Still not to the desired level. Activities to accelerate the development of desired characteristics should occur. Conversely, there should be no management related reduction of late-successional habitat until the objective is attained.

Table 1. Relative Quantities of Seral Stages (Age Classes) by Ownership in the LSR

Seral Stage/ Structural Class	Medford BLM Acres	Roseburg BLM Acres	Umpqua NF Acres	Total Federal Acres	Total Private Acres	Total Acres
Nonforest ¹	592	554	442	1,588 (2%)	3,986	5,574
Grass/forb/shrub (0-10 years)	4,764	4,842	1,270	10,876 (16%)	2,734	13,610
Sapling/pole (11-40 years) ²	4,239	3,893	5,745	13,877 (21%)	9,776	23,653
Mid Seral (41-80 years)	3,361	2,237	2,547	8,145 (12%)	18,594	26,739
Late Seral (81-200 years) ³	6,063	4,444	4,314	14,821 (22%)	1,448	16,269
Old-growth (200+ years) ³	3,795	9,668	400	13,863 (21%)	696	14,559
Modified older stands ⁴	3,538	183	12	3,733 (6%)	0	3,733
Total acres	26,352	25,821	14,730	66,903 (100%)	37,234	104,137
Total late- successional habitat ⁵	9,858	14,112	4,714	28,684 (43%)	2,144	30,828.00

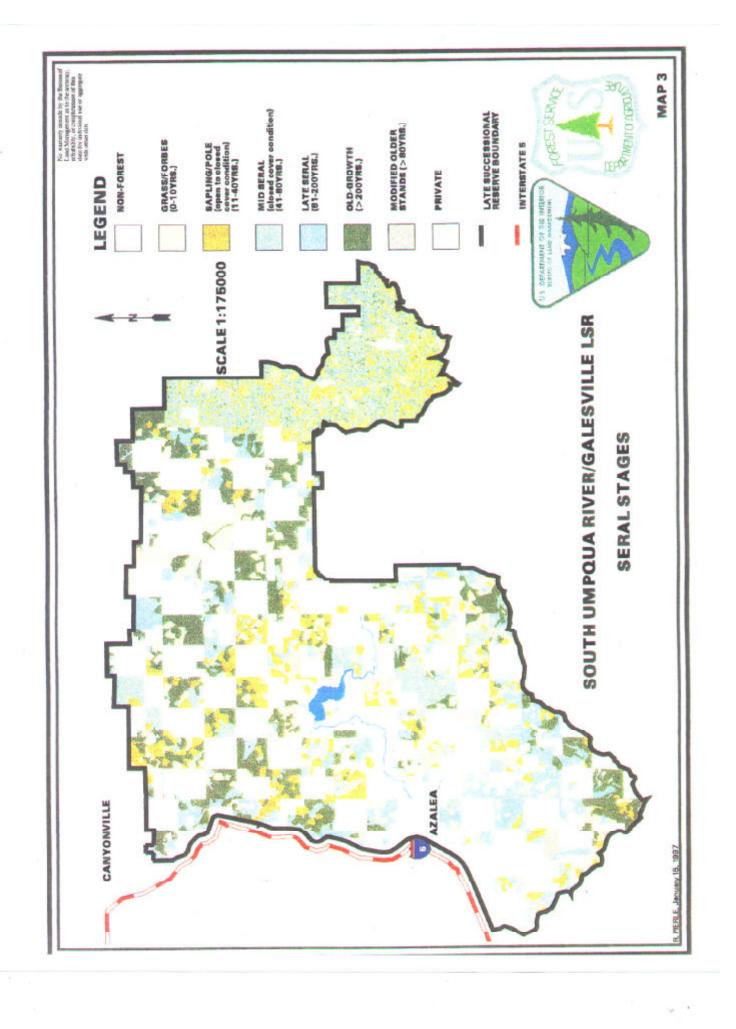
Includes rock outcrops, residential, agricultural, meadows, etc.

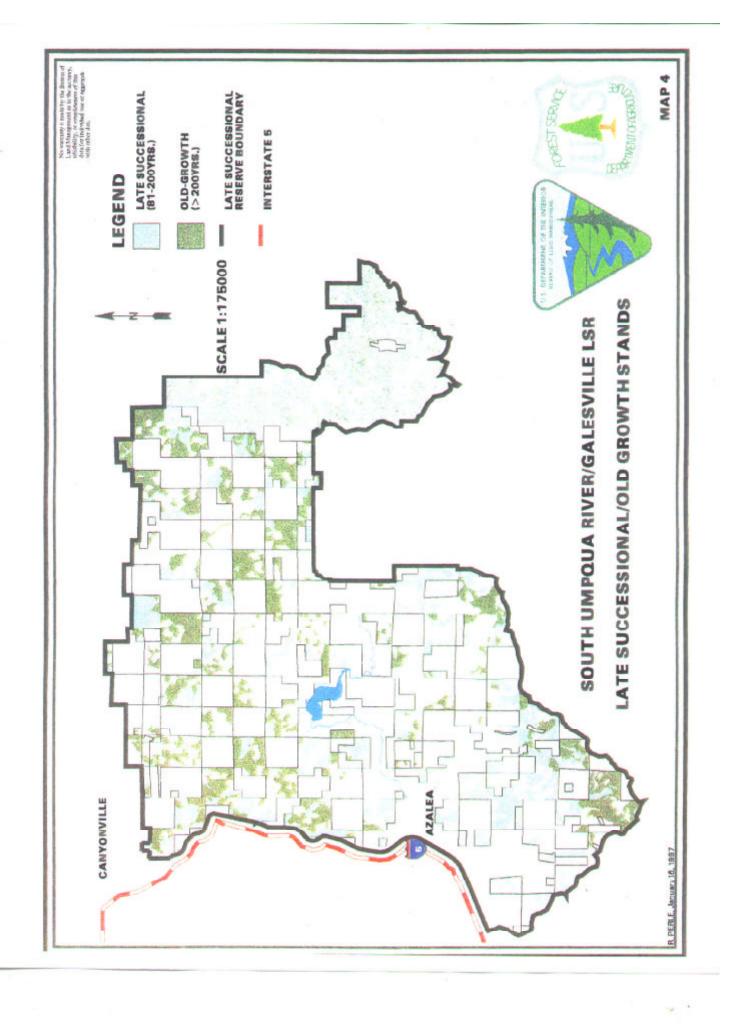
Includes open sapling/pole, closed sapling/pole, and small sawlog stages from Brown (1985)

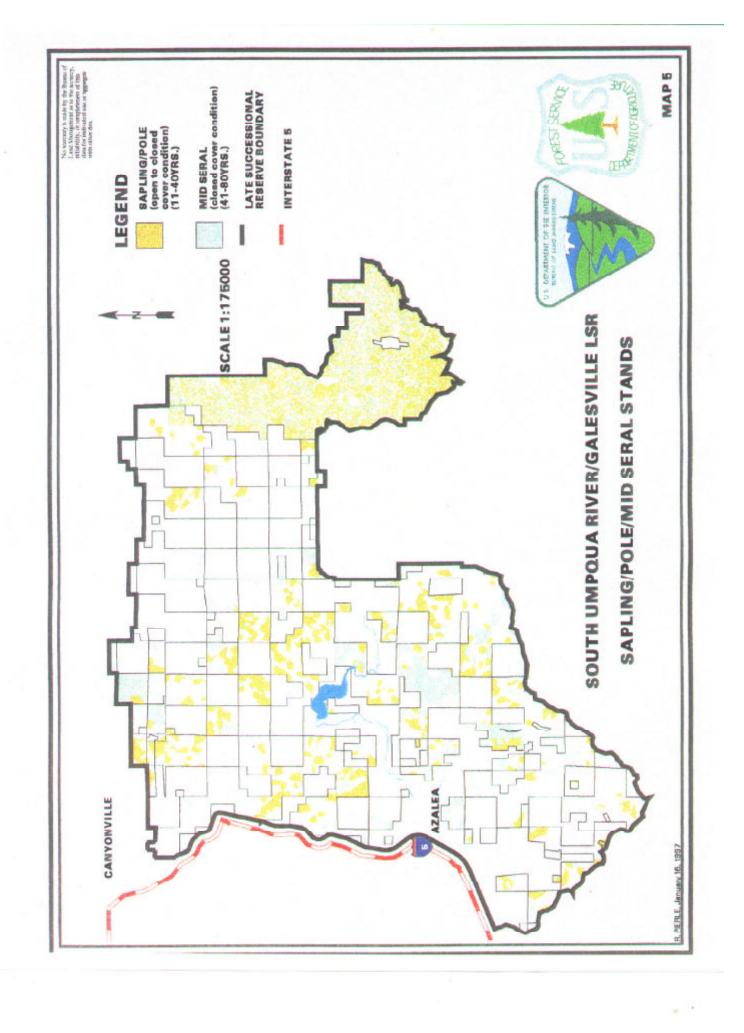
Included as late-successional habitat

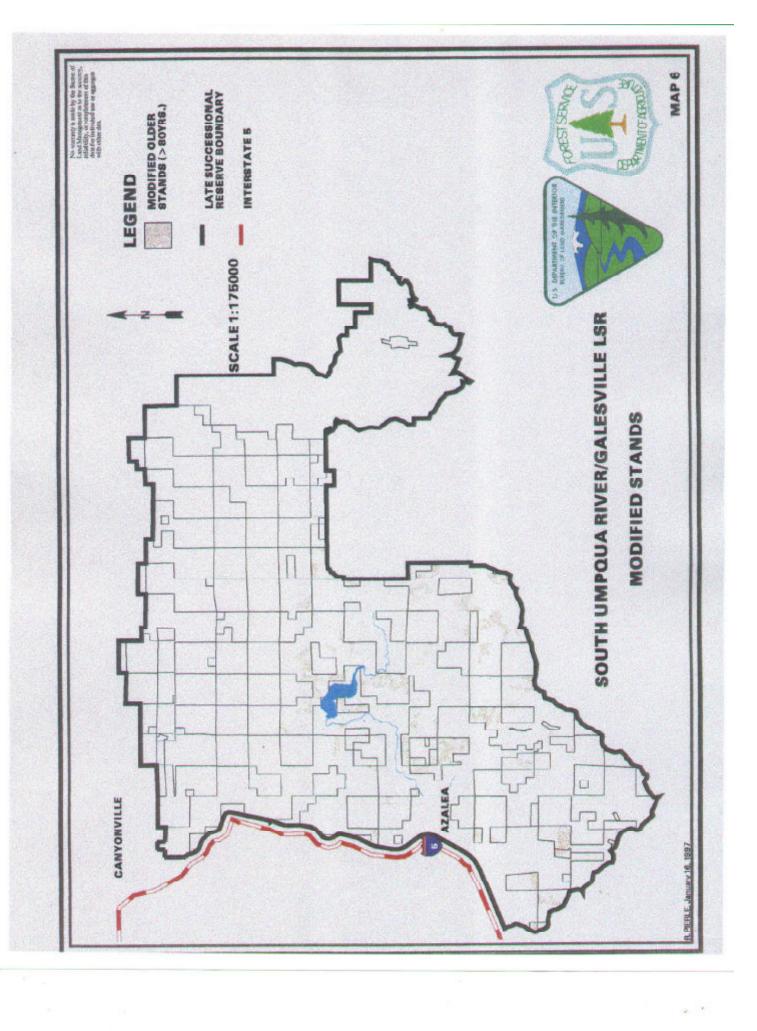
Stands older than 80 years old which have been partial-cut or modified in other ways. Overstory canopy > 40% and diameter > 11" over an early seral understory.

Includes acreage for late seral and old-growth classes.









Species Associated with Late-Successional Habitat

Thousands of species exist within late-successional forests in the Pacific Northwest. The Forest Ecosystem Management Assessment Team (FEMAT) report identified approximately 1,100 species (not counting arthropods) as closely associated with late-successional forests, on Federal lands. Appendix A lists animal and plant species that have special status designation or survey and manage status (ROD, Table C-3), information on their presence in the LSR, and the level of monitoring completed. Similarly, Appendix B lists animal and plant species associated with late-successional forests that are suspected or known to occur within the South Umpqua River/Galesville LSR. These species are included in this assessment because they are known to occur in the LSR or are suspected to occur and might be affected by activities discussed in this assessment.

Animals

Special Status Wildlife Species associated with late-successional habitat in the LSR are listed in Appendix A. The only wildlife species listed as Threatened or Endangered under the federal Endangered Species Act of 1973 as amended, and known to occur within the LSR are the northern spotted owl and bald eagle. The area has potential habitat for peregrine falcons. This LSR is more than 50 miles from the coast so it is not considered potential habitat for marbled murrelets. Other species associated with Late-successional habitat are listed in Appendix B.

Spotted Owls

There are 46 active owl sites in the LSR (a total of 37 on BLM lands and 9 on Forest Service lands). An active site is one which has been occupied by a pair of owls or a territorial single owl for at least one year since 1985.

Suitable spotted owl habitat classified as nesting, roosting, and foraging habitat; or roosting and foraging habitat has been identified on BLM lands within the LSR. On Forest Service lands large late seral and old-growth stands are considered suitable habitat. There are 30,655 acres of suitable spotted owl habitat within the LSR (Map 7).

The amount of suitable habitat around spotted owl sites can be used as a guide to the site's viability and productivity. As a general rule, the guidelines are 50 percent of the area within 0.7 mile of the nest or center of activity in suitable habitat, or approximately 500 acres; and 40 percent of the area within 1.3 miles or approximately 1338 acres. These radii pertain to the Klamath Mountain Physiographic Province.

Of the 46 active owl sites in this LSR, 11 sites (24 percent) contain suitable owl habitat above the guidelines for 0.7 and 1.3 mile radii (see Appendix D, Table D-1). Thirty-five (76 percent) contain suitable owl habitat below the guidelines for both radii. Closer examination shows that 25 of the 35 sites have less than 30 percent suitable owl habitat within the provincial 1.3 mile radius. This assessment considers these values as a guide to identify and

prioritize areas for possible habitat manipulation.

There are ten sites for which successful reproduction has been documented more than twice since 1985, eleven sites have had no documented reproductive success during that period, and the remaining 25 sites have had successful reproduction one or two years since 1985. Overall, the existing sites have been relatively successful, but because of habitat fragmentation, this success is not likely to improve until additional habitat begins to develop on previously harvested lands. Most second growth in this area is 25-40 years old so significant increases in suitable habitat availability may be 30-50 years in the future.

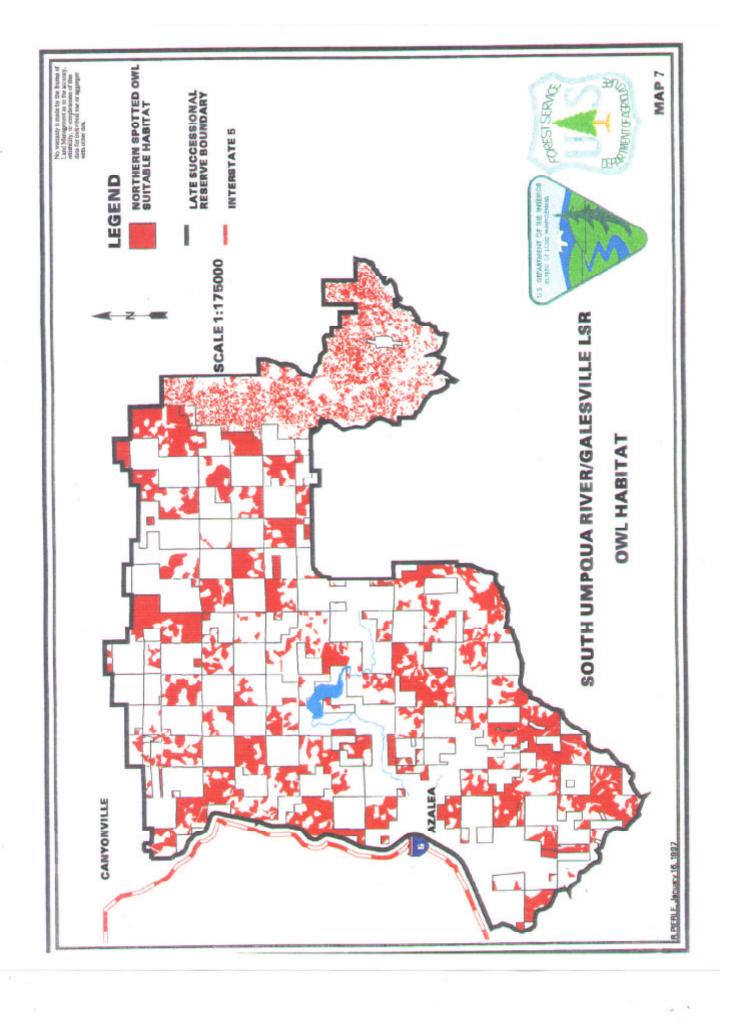
The level of monitoring in this LSR is relatively high so it is unlikely there are very many undiscovered sites, although four new BLM sites were located in 1994. Even with this level of effort, however, reproductive success (confirming presence of young) for 36 percent of the active sites could not be determined in 1994.

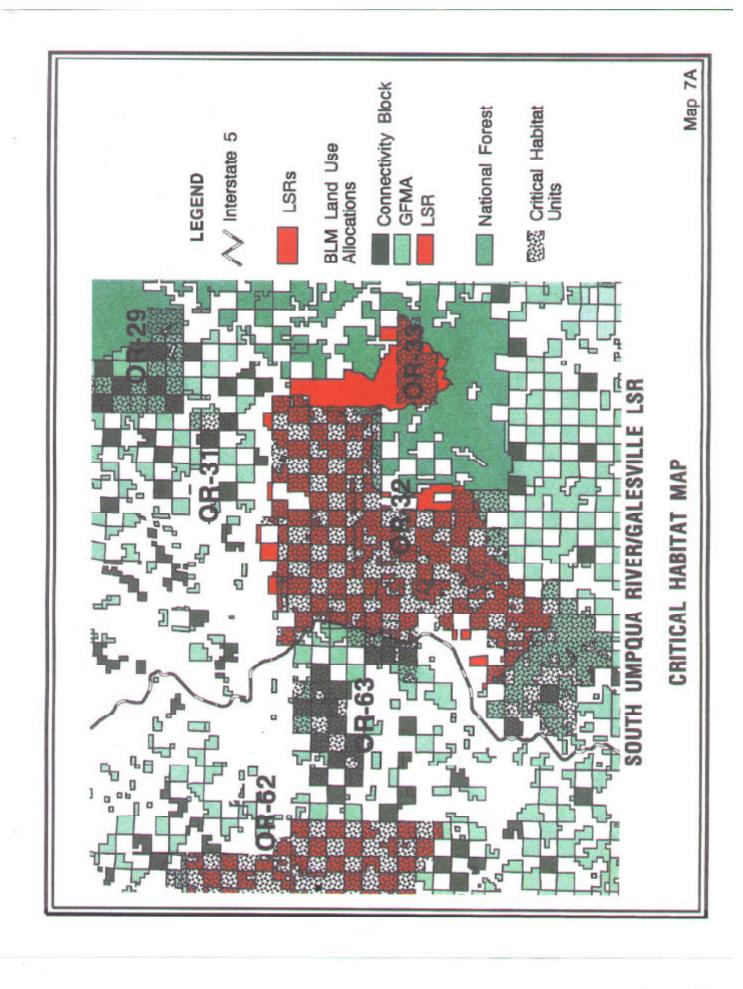
Critical habitat for the recovery of the northern spotted owl was designated in 1992 (Federal Register 57(10):1796-1838) and applies to Federal lands only (Map 7A). The intent of critical habitat is mainly to maintain and provide protection for 1) habitat that contains "habitat elements in sufficient quantities and quality to maintain a stable population of owls" (spotted owls) throughout its range, and 2) critical habitat identified lands that "may be needed" for the eventual recovery and delisting of a species.

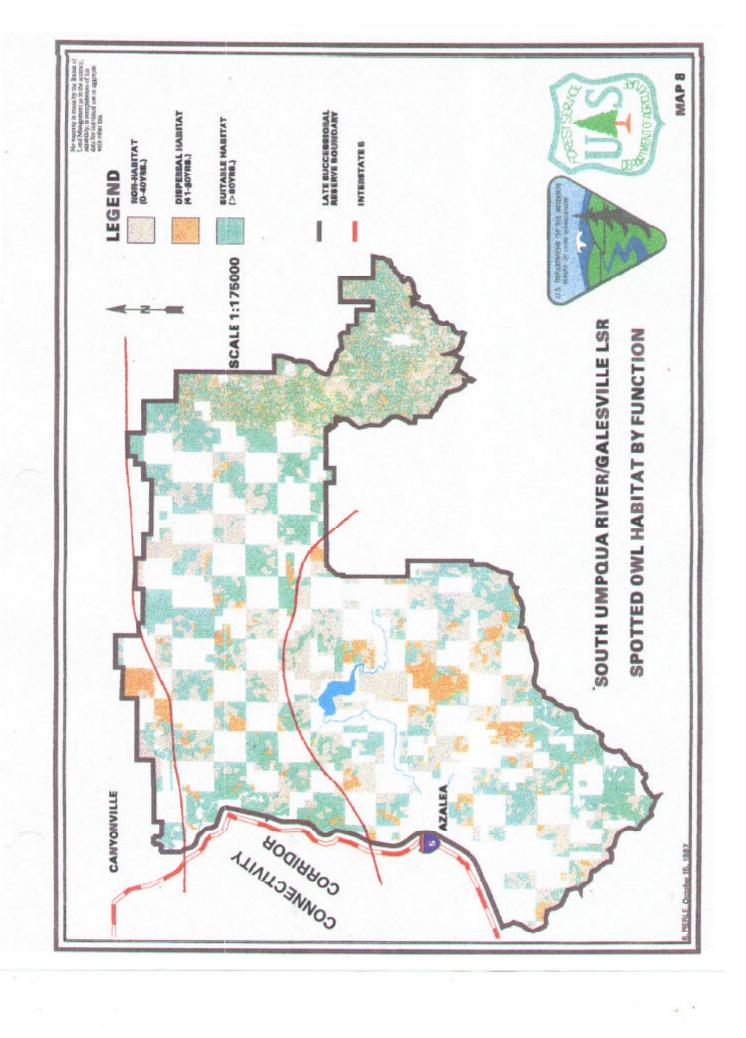
Critical habitat unit (CHU) OR-32 is larger in gross federal acres (69,731 acres) than the LSR (66,903 acres) but the boundaries are similar to the BLM portion of the LSR. The boundary of CHU-OR-32 includes 26,691 acres (38%) from the Roseburg District and 43,040 acres (62%) from the Medford District. CHU-OR-33 is a small unit which lies within the Forest Service portion of the LSR. These CHUs provide connectivity between the Western Cascades, Coast Range and Klamath Mountain Physiographic Provinces.

Within CHU-OR-32, 65,208 acres are known to be forested. Of this total, 34,414 acres (53%) are currently considered suitable spotted owl habitat, and 30,794 acres (47%) do not meet suitable spotted owl habitat criteria. Since the landscape consists of checkerboard ownership, only about half of the land mass within the CHU boundary (i.e. 25 percent of the landscape) contains suitable owl habitat. This low number shows a need to increase suitable owl habitat in the CHU.

The target for the CHU is to bring all of the BLM lands (that are capable) to the point where they contain suitable habitat for spotted owls. Emphasis should be placed in those areas of the landscape where large gaps in suitable owl habitat currently occur, and which contribute to the fragmentation of forest stands. CHU-OR-32 was identified as OD-16 in the Draft Recovery Plan for the Northern Spotted Owl (USDI 1992a). The recovery plan identified current projected and future projected owl pair numbers for this area. Based on five years of data collected from 1986 to 1990, or 1987 to 1991, the Draft Recovery Plan in April 1992 expected the number of owl pairs to drop from 23 known pairs to 17, if the population stabilized with the habitat conditions at that time. Projections into the future were also made.







Twenty two pairs were projected to live within the CHU if all of the forest stands in Federal ownership capable of attaining suitable habitat characteristics were to develop suitable spotted owl habitat. Since the CHU-OR-32 (OD-16) boundary is nearly identical to the BLM portion of the LSR boundary, the Draft Recovery Plan estimate of owl pairs can be applied to the BLM lands within the LSR.

A revised Final Draft of the Recovery Plan (USDI 1992b) identified CHU-OR-32 as OD-32. It revised the projected owl pair numbers expected within the boundary of CHU-OR-32. Pair numbers were projected to drop from 21 known pairs to 11, if the population stabilized with the habitat conditions at that time. Fifteen owl pairs were projected in the area if all the forest stands in Federal ownership capable of attaining suitable habitat characteristics were to develop suitable spotted owl habitat.

Based on pair determination as outlined in the spotted owl survey protocol, 33 owl pairs were present within the boundary of the LSR as of 1994. Not counting pair data from the Forest Service portion gives a total of 30 spotted owl pairs on BLM lands. This is eight owl pairs above projections in the Draft Recovery Plan of April 1992 and 15 pairs above future projections in the Final Draft Recovery Plan (December 1992b). Differences in pair numbers between the Recovery Plan and known owls in the LSR is due to the assumptions used in the Recovery Plan. Because the Final Draft Recovery Plan (USDI 1992b) has not been approved the pair numbers for CHU-OR-32 are not official numbers.

The data used to describe the current situation in December 1992 (Final Draft Recovery Plan) used survey data from 1987 to 1991 as the basis. The two LSRs (identified as Designated Conservation Areas (DCA) OD-31 and OD-32 in the Final Draft Recovery Plan for the Northern Spotted Owl) in the southern portion of the Roseburg District had 19 and 21 owl pairs respectively on federal lands in 1991. In 1994 (Roseburg District Data) OD-31 had 20 owl pairs and 3 sites with male and female but pair status unknown. In 1994 OD-32, which corresponds with the BLM portion of this LSR, had 30 pairs.

On the surface, this LSR appears to have more spotted owl pairs than other LSRs in southwestern Oregon. The reason more spotted owls occur in this LSR compared to other LSRs in the region is not known. Search efforts from 1990 to the present increased over the efforts from 1987 to 1990. The increased numbers may reflect the increased search effort. A direct comparison of numbers to other LSRs is not possible. Habitats differ in quality, quantity, and geographic location. Also the level of effort is not the same for the LSRs, so a comparison of owl numbers between them is not possible.

Another reason there may appear to be more spotted owls in the South Umpqua/Galesville LSR area of the Klamath Mountains, is that the median home range size is 1,411 acres (Thomas et al. 1990). The median home range in the provinces in California, Oregon, and Washington is 4,106 acres (Thomas et al. 1990). The smaller home range would indicate a larger number of owls could use the available habitat in the South Umpqua/Galesville LSR area.

Even if all of the BLM lands within CHU-OR-32 contained suitable spotted owl habitat, only about 50 percent of the landscape would have suitable spotted owl habitat. Opportunities such as creating partnerships with private landowners, or blocking up BLM lands by purchase or land exchange could be pursued to increase the amount of suitable habitat within the LSR boundaries.

American Bald Eagle

Up until 1998 the bald eagle was known to occur in the area but did not appear to nest within the LSR. In the spring of 1998 a nest location was found north of the Galesville Dam. The road near it was closed in the fall of 98.

Peregrine Falcon

The peregrine falcon occurs in the area, but does not appear to nest within the South Umpqua River/Galesville LSR boundary. This species is not considered as associated with late-successional habitat but is briefly discussed here due to its endangered status. Peregrines have been documented in the vicinity but surveys have not been conducted to locate this species in the LSR (as of 1994). The parent material that makes up the topography within the LSR, has in some places eroded to create cliffs and ledges. These areas considered to be potential peregrine falcon habitat are present within the LSR. Surveys to inventory potential peregrine habitat in the LSR have not been done.

Marbled Murrelet

The South Umpqua River/Galesville LSR is located outside of the 50 mile zone inland from the Oregon coast. The western edge of the LSR is 60 air miles from the coast. Known information about the biology and inland nest sites of the murrelet indicates that it is unlikely to be found beyond the 50 mile zone set by the new forest plan (ROD) and the threatened status determination (USDI 1992).

Avian Species

Over 26 bird species have been documented to be dependent or associated with mature to old-growth forests in the Pacific Northwest (Ruggiero et al. 1991, Brown 1985). The majority of this group is composed of migratory bird species known as neotropical birds. Neotropical refers to the seasonal behavior of breeding in North America in the summer and flying south to Mexico, Central America, and South America to spend the winter.

Appendix A and B list the bird species that occur or are suspected to occur in the LSR. All of these species depend on mature and older forest for their food, resting and nesting needs. Some species, like the brown creeper, hermit thrush, pileated woodpecker, winter wren, hairy woodpecker, and Vaux's swift are closely associated with late-successional forests.

A large number of bird species not associated with older age stands are present throughout the LSR. As stand ages increase through time, the available habitat for these species will diminish.

Amphibian and Reptile Species

The amphibian species in Appendix A and B use unique habitats that are found across vegetation classes. These habitats include large down woody material, snags, talus slopes, creeks, seeps, ponds and wetlands. These features are present throughout the LSR.

An inventory of amphibians in the South River Field Office (Roseburg District) was completed by Bury in 1994. The northern red-legged frog, foothill yellow-legged frog, and clouded salamander have been documented in the LSR. The spotted frog is not expected in the LSR and was not found during the 1994 inventory. The tailed frog is present in the geographic area but was not documented within the northern portion of the LSR. This species can serve as an indicator of watershed water quality, because of its sensitivity to changes in sediment loads, and water temperature. The cascades frog was located north of the LSR boundary at higher elevations. This species is probably present, especially on Forest Service lands within the LSR. The southern torrent salamander was documented in the northern area of the LSR and is also known to occur elsewhere in the LSR.

The Del Norte salamander, a category 2 species, is known or likely to occur in and adjacent to the LSR. This species occurs in talus slopes protected by an overstory canopy that maintains cool, moist conditions on the ground. This species habitat is expected to improve in the LSR as young stands age and provide at least 40 percent canopy cover. The ROD established protection buffers for this species which would be managed as LSR. Any activities would comply with the management guidelines contained in this assessment.

Mammals

Mature and older age classes are an important habitat component for many mammals, such as bats, red tree voles, fisher, pine marten, ringtail, elk, and deer. All the bat species listed in Appendix A utilize large older trees for roosting and resting between feeding periods (Cross 1988; Christy and West 1993). No information is available on the hibernating or nursery areas used by these bat species in the LSR. Limited inventories to locate caves, mine shafts, and other structures used by bats have been conducted in the LSR.

Mammals like the red tree vole use old-growth, late seral, and closed mid seral age classes for primary habitat (Carey 1991). These seral age classes are used for nesting, resting, and foraging (Carey 1991). Other mammals like the fisher, pine marten, and ringtail require large blocks (greater than 200 acres) of mature to old-growth forest stands. This is important because the environment (temperature, moisture, and plant community) found in interior portions of large blocks of mature and old-growth forests is different than smaller pieces (less than 200 acres) of mature and old-growth stands.

Elk and deer forage in open areas where the vegetation includes grass-forb, shrub, and open sapling communities. Both species use a range of vegetation age classes for hiding. This hiding component is provided by large shrub, open sapling, closed sapling, and mature or old-growth forest components (Brown 1985).

The northern portion of the LSR includes two elk management areas (Green Butte and Hyde

Ridge) identified in the Roseburg District RMP (1995b). Communication with the Oregon Department of Fish and Wildlife identified this area as lacking current estimates of the elk population (personal communication).

Elk management goals for the identified management areas have not been developed, though any management for elk would only be ancillary to any activity benefiting LSR objectives. Having elk in the LSR is seen as a benefit and not a goal of management. Some potential management activities designed to improve elk habitat conditions may support LSR objectives and others may conflict. Managing for optimal cover (basically late-successional stands) and thermal cover are essentially identical to LSR goals and objectives. Closing roads to reduce harassment to elk may also benefit LSR goals by reducing disturbance to late-successional associated species, minimizing loss of habitat due to illegal firewood cutting and reducing the chance of accidental wildfire ignition. Some activities, such as creating or maintaining early seral stands for forage may conflict with LSR objectives, although it may depend on how extensive such proposals might be. This type of management would not be necessary throughout most of the LSR since private lands would probably continue to provide early seral stages for elk foraging areas. Transplanting elk from other areas may be neutral in regard to LSR objectives. Any approach to elk management would benefit from information about distribution and habitat use of elk within the LSR. This information is not currently available.

Invertebrate Species

The ecosystem in the Pacific Northwest is dependent in part on the invertebrate species found in the area. These species serve as a primary energy source for the rest of the food chain. The LSR is likely to contain representative members of the 3400 species of arthropods (insects, spiders, millipedes, centipedes) that have been catalogued in coniferous habitats in the Coast Range and Western Cascade Provinces (Parsons et al. 1991). Many of these species are associated with late-successional habitat. Inventories for invertebrate species listed in Appendix A have not been done.

Other invertebrates like snails and slugs are abundant in the Pacific Northwest in both aquatic and terrestrial systems. Over 350 species of snails and slugs have been described from western North America. Within the LSR, two species of land snails (Helminthoglypta hertleini, Vespericola shasta) and three species of slugs (Deroceras hesperium, Prophysaon coeruleum, P. dubium) are suspected to be present and are on the Survey and Manage list in the ROD. Other mollusc species associated with late-successional forests are listed in Appendix B. Inventories for these mollusc species have not been done in the LSR.

Plants

Fungi, Lichens, and Bryophytes

The Forest Ecosystem Management Assessment Team (FEMAT) report considered 109 fungi, 26 lichen, and 32 bryophyte species endemic to the Pacific Northwest to be closely associated with late-successional forests. Unrecorded observations and the variety of habitats within the

LSR indicate the possibility some of these species may be present.

No surveys for fungi, lichens, or bryophytes have been conducted for any of the Survey and Manage species listed in the ROD. Surveys would be completed before ground disturbing activities are implemented in fiscal year 1999 or later (ROD).

Habitat components important to fungi, lichens, and bryophytes include dead down wood, standing dead trees, and live old-growth trees, as well as a diversity of host species and microhabitats. Generally these habitat characteristics are achieved by more extensive and interconnected late-successional forest conditions.

Small patches of late-successional forest fragments distributed across the landscape can function as refugia and centers of dispersal where these species may persist until suitable habitat conditions become available in adjacent stands. Patches of late-successional forests 25 acres or less may provide habitat for a wide variety of organisms even though edge effects may eliminate fully buffered interior habitat.

Older stands that are well distributed geographically are important to the survival and persistence of many plant species in the ecosystem. Some lichens, as an example, do not become established until stands are several hundred years old. The location of old-growth stands, such as ridgelines that are optimum for dispersal, is also important for some species.

Older stands that provide complex canopy structure are beneficial for many plant species. Trees that are asymmetrical or have leaning boles promote a diversity of habitat substrates and often have more lichen and moss epiphytes on large lateral limbs than symmetrical trees.

Vascular Plants

The FEMAT report considered approximately 124 vascular plant species to be closely associated with late-successional forests. Vascular plants known or suspected to exist within the LSR are listed in Appendix B.

A review of the range and habitat requirements for the vascular plants listed as Survey and Manage species in the ROD indicates the following species are potentially present within the LSR:

Allotropa virgata

Candystick

Aster vialis

Wayside aster

Cypripedium fasciculatum

Clustered lady-slipper orchid

Cypripedium montanum

Mountain lady-slipper orchid

Plant surveys have been conducted to a limited extent for timber sales and other management activities, and only *Allotropa* has been found. No other special status species have been found.

The Oregon Klamath Physiographic Province has some of the largest numbers of endemic vascular plant species in the Pacific Northwest. Rare and local plants are often restricted to distinctive soils, such as serpentine, and to special habitats, such as rock outcrops, bogs, and wetlands. Endemic species associated with serpentine soils include:

Calachortus umpquaensis

Umpqua mariposa lily

Viola hallii

Hall's violet

Arabis aculeolata

Waldo rock cress

Lupinus sulphureus var. kincaidii

Kincaid's lupine

Except for the lupine, these species are serpentine endemics occurring at Callahan Meadows.

The lupine is rare and occurs there as well, but in a granitic inclusion.

Most species closely associated with late-successional forests are long-lived perennials. Many woody and herbaceous vascular plants are extremely long-lived, requiring decades to reach reproductive size.

Habitat components, such as coarse woody material, associated with late seral, riparian, and old-growth forests are essential for some species of vascular plants. Some vascular plants establish themselves only on large decaying logs or coarse woody material. Microclimate, log decaying processes, and fungal associations may be altered by the removal of canopy cover.

Fisheries

LSRs are an important component of the Aquatic Conservation Strategy. Late-successional characteristics offer core areas of high quality stream habitat that will act as refugia and centers from which degraded areas can be recolonized as they recover. The objectives for maintaining and enhancing late-successional habitat conditions in the LSR would also serve to enhance fish habitat.

The South Umpqua River historically supported healthy populations of resident and anadromous salmonid fish. A 1937 survey conducted by the Umpqua National Forest reported that salmon, steelhead, and cutthroat trout were abundant throughout many reaches of the river and its tributaries (Roth 1937). Excellent fishing opportunities for resident trout and anadromous salmon and trout historically existed within the South Umpqua River (Roth 1937). The historical condition of the riparian zone along the South Umpqua River favored conditions typical of late-successional forests found in the Pacific Northwest. The river and its tributaries were well shaded by the canopy closure associated with mature trees. Streambank stability was provided by the root systems of these mature trees.

Winter steelhead and resident rainbow trout (Oncorhynchus mykiss), fall and spring chinook salmon (Oncorhynchus tshawytscha), coho salmon (Oncorhynchus kisutch) and sea-run cutthroat and resident cutthroat trout (Oncorhynchus clarki clarki) have been documented utilizing the LSR. Over the last 150 years, salmonids have survived dramatic changes in the environment where they evolved. The character of streams and rivers in the Pacific

Northwest have been altered by settlement, urban and industrial development, and land management practices. Modifications in the landscape and waters of the South Umpqua Basin, beginning with the first settlers, have made this river less habitable for salmonid species (Nehlsen 1994). The Galesville Dam has eliminated anadromous species and limits the fisheries to resident populations on the upper portions of Cow Creek.

The South Umpqua River once supported abundant populations of chinook and coho salmon, steelhead, and cutthroat trout. These species survived in spite of the naturally low streamflows and warm water temperatures that occurred historically within this subbasin (Nehlsen 1994). Currently, there has been a general decline in numbers and the range of anadromous fish species since record keeping. A 1991 status report identified a total of 214 native, naturally spawning stocks as vulnerable and at-risk of extinction (Nehlsen 1991). According to this 1991 report, within the South Umpqua River, one salmonid stock is considered extinct, two stocks of salmonids are at-risk of extinction, and two stocks were not considered at-risk.

The coastal coho salmon (Oncorhynchus kisutch) has been listed by the National Marine Fisheries Service (NMFS) as a threatened species under the Endangered Species Act (ESA) of 1973, as amended. The West Coast steelhead (Oncorhynchus mykiss) has been "proposed" for listing by NMFS as a threatened species under the ESA. The Umpqua basin cutthroat trout (Oncorhynchus clarki clarki) has been proposed for de-listing. Two fish species, the Pacific lamprey (Lampetra tridentata) and the Umpqua chub (Oregonichthys kalawatseti), are on the USFWS list as species of concern and are considered Bureau Sensitive species by the BLM (Manual 6840). All of these species have been documented within the South Umpqua River or suspected to live in streams within this LSR.

Limiting factors affecting aquatic health and the fisheries resource differ among the streams. The limiting factors affecting fisheries in this LSR include low summer flows, elevated water temperatures, restricted access for anadromous salmonids to areas of their historic distribution, the lack of instream habitat structure (large woody debris, boulders, side channels, and pools), the relatively high amount of sediment found in the gravel substrates required by spawning salmonids, and the lack of large woody debris for future recruitment into the stream channels from the adjacent riparian area.

Low summer flows and elevated water temperatures are inherent to interior southwest Oregon. Natural contributors to these conditions include geology, climate, low elevation and stream orientation. The problems of naturally low flows and high water temperatures are compounded by human-related activities. Logging, placer mining and livestock grazing in riparian areas and some logging-related activities in upland areas have reduced the productivity of many streams in the LSR. Roads constructed in riparian zones and erosion from tractor skid roads, as well as from poorly constructed and maintained road systems, have degraded streams throughout the LSR. Roads constructed within riparian zones and timber harvested to the edge of streams have removed shade and potential sources of large woody debris. In addition, salvage operations commonly removed woody material from streams. The vegetative cover significantly influences the numbers and distribution of the fish species

listed in this assessment. The canopy cover over streams range from essentially nothing to almost 100 percent in certain areas of the LSR.

Minimizing or reducing the effects of the limiting factors within the LSR on the fisheries resource should be a goal within this LSR. The designation of the upper South Umpqua River as a Tier 1 Key Watershed further emphasizes the intent of these watersheds as future refuges for the at-risk and depressed stocks of anadromous salmonids. Part of the watershed restoration strategy within Key Watersheds is to reduce the amount of existing roads. If funding is insufficient to implement reduction, there will be no net increase in the amount of roads in Key Watersheds.

Environmental conditions and activities outside the LSR, such as ocean productivity, sport and commercial fishing, and private and public land management activities greatly influence the number of anadromous fish returning to spawn. The checkerboard ownership pattern of private and BLM administered lands also influences the management abilities of the fisheries resource within the LSR. However, opportunities exist for the BLM and Forest Service to positively affect the streams in this LSR and to improve their overall aquatic health.

Silviculture treatments such as planting unstable areas along streams, thinning densely-stocked young stands, releasing young conifers overtopped by hardwoods, and reforesting shrub and hardwood dominated stands with conifers would improve streambank stabilization, increase shade, and accelerate development of large wood desired for future in-stream structure. The watershed analysis documents provide more specific information on fish habitat and evaluate and identify priority projects for fish habitat improvements.

Other Uses

Timber Harvest

Timber harvesting is expected to continue to be the dominant use on private timber lands in this area. Nearly all of the private lands have been harvested. Ninety-four percent of the private forestable land within the LSR is less than 80 years old. Fifty-six percent of the private forestable lands are in the mid seral (41-80 year) class (see Table 1, page 20).

On Federally managed lands, no harvest will occur on stands older than 80 years, except in a limited number of stands that could benefit from risk reduction or density management to hasten attainment of objectives. Some density management may occur in stands less than 80 years old to hasten development of old-growth characteristics.

Road construction in the recent past has been associated with timber harvesting. Generally, main haul forest roads have been located where the gradient is gentle, frequently along streams. These roads, for the most part are needed and used for accessing areas for land management activities. It is difficult to close roads in the checkerboard pattern of ownership because roads often access private property.

Research

The main extent of research within the LSR is tied to the Forest Genetics Program. This program, established in the 1960's, is an ongoing cooperative project with Federal agencies and private timberland owners coordinated by the Northwest Tree Improvement Cooperative. Trees which exhibited good form and volume growth characteristics were selected as "plus trees". The "plus trees" remain an important component of the research program.

The seedlings of the "plus trees" are grown in progeny test sites to test the qualities of the parent "plus trees". There are four Douglas-fir progeny test sites within the LSR. The size of these sites vary from 6 to 19 acres. All were planted on a grid pattern and were fenced to reduce wildlife damage. The Roseburg BLM district maintains one progeny test site in the LSR. The Cow Creek Progeny Test Site is located in T. 31 S., R. 4 W., Sec. 29. Trees in this site are now thirteen years old. The Medford BLM maintains three progeny test sites in the LSR. The Galesville Progeny Test Site is located in T. 31 S., R. 4 W., Sec. 21 and the two Whitehorse Progeny Test Sites are located in T. 32 S., R. 4 W., Sec. 3.

Routine maintenance of the progeny test sites consists mainly of measuring the trees for height and diameter at five year intervals and controlling the competing vegetation. Hardwoods and other conifer species have also been removed from these sites to maintain uniform growing conditions for the test trees. Each test tree in the sites have been mapped and has pedigree information. The sites have long term value in two ways; to demonstrate and monitor genetic differences and for gene conservation as genetic reserves of pedigreed material from natural stands throughout the region.

Several other minor research sites exist in the LSR. There is an out planting site of rust resistant sugar pine as a field trial for resistance screening. Other small plots such as System1 plots used to validate that growth model and Campbell's drought stress plots exist within the LSR.

Agricultural and residential

Agricultural and residential uses are found on the intermingled private ground and make up about 3 percent of the LSR. These areas will not attain late-successional characteristics. Agriculture and residences occur primarily in the valleys of the South Umpqua River and Cow Creek and their major tributaries. There are some scattered isolated parcels in the upland areas.

Utility Rights-of-way

Utility rights-of-way consist of power line, gas line, and fiber optic telephone cable corridors that run through the LSR. These corridors may disrupt connectivity, but may not be a barrier to movements, depending on the location or the species. These areas make up less than 1 percent of the federal land and will not attain late-successional characteristics.

Mining

There are numerous mining sites located throughout the LSR. Mining and mineral exploration over the past decade has been minimal. Some portions of the LSR have a

moderately favorable potential for mining gold, silver, copper, lead/zinc, and chromium/nickel deposits. Exploration would be expected to concentrate on potential lode deposits.

Recreation

Recreation within the LSR occurs in dispersed and concentrated forms. The most common forms of dispersed recreation found in this area include driving for pleasure, camping, picnicking, hunting, gathering (berries, flowers, mushrooms, greens, and rocks), photography, and target shooting. No Off Highway Vehicle trails exist or are proposed in the LSR. Lands in the LSR are generally managed for dispersed recreation. The proposed Bear Gulch Research Natural Area (RNA) is within the LSR. This RNA is closed to Off Highway Vehicles and recreation use is discouraged at this time.

Developed recreation sites in the LSR are concentrated in the Galesville Reservoir area in the Cow Creek drainage on the Medford District, BLM. The locations and a more complete list of existing and proposed recreation facilities are included in the Medford District's Upper Cow Creek Watershed Analysis document. Galesville Reservoir, completed in 1986, has had a significant impact on recreation and has led to designating the surrounding area as a Special Recreation Management Area. A portion of the LSR is within the Upper Cow Creek Recreation Area (UCCRA) established jointly with the Medford District BLM, Umpqua National Forest, Roseburg District BLM, Oregon Department of Fish and Wildlife (ODF&W), and Douglas County Parks Department. Existing facilities include several trails, Chief Miwaleta Picnic Area and boat ramp, and a designated wildlife area on the eastern end of Galesville Reservoir. Current camping use in the Galesville Reservoir area is dispersed. There is an increasing demand for recreational opportunities in this area. The current demand is not being met. Plans have been developed to construct a campsite on BLM administered land on the north side of the reservoir to concentrate use. Environmental effects could be controlled and lessened.

Stream Habitat Improvements

Habitat improvement projects, consisting of placement of logs and boulders in streams to improve habitat complexity, have been constructed in Quines, Bull Run and Whitehorse Creeks to improve spawning and rearing habitats for adult and juvenile anadromous fish. Additional opportunities may become apparent as data from stream surveys becomes available. The watershed analysis documents contain more information on stream habitats and the Aquatic Conservation Strategy.

Special Forest Products

Special forest products is the term used for those forest products commercially and recreationally harvested/collected in relatively small amounts. Special forest products collected in the LSR include vegetative materials such as grasses, beargrass, tree boughs, Christmas trees, burls, seeds, roots, bark, berries, mosses, ferns, edible mushrooms, tree seedlings, transplants, poles, and firewood. Until recently, the major special forest product gathered had been firewood. Logging slash is now the primary source of firewood cut. No live trees or down wood is cut as firewood. Recently, beargrass and tree boughs have become more important as marketable species. The demand for other products may increase

in the future.

Data Gaps

Some data gaps were identified during this assessment which are important for long term management of this area. These data gaps include:

- an inventory of modified older stands to determine which stands may not be functioning as late-successional habitat,
- an analysis of block sizes for late-successional habitat and interior habitat blocks,
 - stream habitat surveys for some streams that may need habitat improvement

This information will be added to the Assessment as it is obtained.

IV. Desired Future Conditions

Late-successional stands are estimated to have covered from 40 to 75 percent of Southwestern Oregon, historically (USDA 1993). It is assumed that late seral processes were functioning in this range. Because of the amount of intermingled private ownership that is in early to mid seral stages, and the objective of LSRs to protect and enhance late-successional and old-growth conditions, the upper end of the historic range is appropriate for federal lands. The objective for management in this LSR will be to restore and maintain 60 to 75% of the federal lands in late-successional stands.

Old-growth Definitions and Desired Future Conditions

These definitions for old-growth forests within the LSR provide a reference point for monitoring and a target for the development of future stand characteristics. Treatments within younger stands would be directed to help attain a desired future condition (DFC) represented by these definitions. For older stands, if existing conditions meet the definitions, any management action would be designed to maintain those characteristics. In many instances, no action would be appropriate.

There are differences in structural elements as stands transition through seral stages, as well as within seral stages, due to differences in site productivity. Age alone may be a poor indicator of old-growth structure. Certain features, such as large trees, may develop on more productive sites before 200 years. On harsher sites, a longer period may be required to attain the large size. Recruitment of coarse woody material as snags and logs often occurs in waves related to some event. Wet sites typically have greater amounts of down wood and snags and are more likely to exceed values in the following tables. Dry sites are more likely to approach the minimum levels due to stand histories of hot or frequent fires. The LSR will be managed to exceed the stated values, as detailed on the following pages.

Some other characteristics of late-successional and old-growth forests are difficult to quantify but are acknowledged to be a part of the description. These characteristics would be:

- relatively high decadence as measured by the abundance of snags, down logs, and deformed trees,
- · presence of canopy gaps, and
- · diverse species composition, depending on site conditions.

There is a great deal of variation within the broad category of late-successional forest. In this LSR, even-age stands approximately 80 years old which originated from a stand-replacement fire, frequently have a closed canopy, an open understory, and are beginning to show some mortality and snag creation. These stands do provide some degree of suitable habitat for several species which are associated with late-successional habitat and therefore do make a substantial contribution to the objectives of the LSR. However, they do not provide nearly the quality or diversity of late-successional habitat typically found in unentered stands which have not had a stand replacement fire for 200 years or more. These stands often have the full

range of habitat characteristics and offer more suitable habitat for most or all of the species associated with late-successional habitat.

Fuels

It appears likely that historic fire return intervals for this LSR are probably on the order of 30-80 years (Agee 1993). Desired future conditions for fuel loadings are those that support these return intervals while least impacting desired levels of coarse woody material and snags. In general this means, fuel loadings could be higher on cooler aspects.

To reduce the risk of habitat loss, fuel loadings around populated areas, high use areas, and other areas of higher ignition probabilities should be reduced. Fuel ladders in these areas should also be treated to reduce the chances of a running crown fire. Fuel concentrations throughout the LSR should be discontinuous.

Old-growth Definitions and DFC for Western Hemlock, Cool Douglas-fir/Hemlock, and Cold Douglas-fir Vegetation Zones

The Western Hemlock, Cool Douglas-fir/Hemlock, and Cold Douglas-fir vegetation zones, which make up nearly 60% of the LSR, can be characterized by the definition for old-growth Douglas-fir on western hemlock sites (Old-Growth Definition Task Group, 1986). The interim definitions for these stands were based on the minimum standards so that the definition would encompass nearly all old-growth stands. They should not be taken as optimum for old-growth functions or as the averages found in old-growth stands. Franklin and Spies in 1991 revised the definition so that it would do a better job of characterizing old-growth Douglas-fir stands. The lower values of the revised definition relaxed the criteria to the point that many mature stands met the definition of old-growth. Since the focus of the LSR is to protect and enhance late-successional and old-growth habitat, the desired future condition would exceed the interim standards. The desired condition would always be above the interim through the best judgement of an interdisciplinary team, based upon the relative productivity and natural conditions. As more information is gathered, it can be added to this assessment. The following table shows both standards.

Table 2. Definitions for Old-growth Douglas-fir on Western Hemlock Sites (based on Old-Growth Definition Task Group, 1986) DFC is based on exceeding the Interim standards. Revised standards shown for reference only.

Stand Characteristic	Interim Standards	Revised Standards	
Live trees	ika propinsi Karata perkingangan	cromalitătică distribution :	
Large trees	Douglas-fir > 32" dbh or > 200 years old ≥ 8 per acre	All species > 39" dbh ≥ 4 per acre	
Shade-tolerant trees > 16" dbh	≥ 12 per acre	≥ 4 per acre	
Сапору	Deep multi-layered	Deep multi-layered	
Snags		production and the second second	
Snags > 20" dbh and > 15' tall	≥ 4 per acre	≥ 2 per acre	
Down Logs			
Log biomass	≥ 15 tons per acre including 4 pieces per acre ≥ 24" diameter and > 50' long	≥ 12 tons per acre	

Old-growth Definition and DFC for Douglas-fir/Chinkapin and Tanoak Vegetation Zones

For the Douglas-fir/chinkapin and tanoak vegetation zones, which make up about 37% of the LSR, the old-growth forest defined by Bingham and Sawyer (1991) for the Klamath province and northern California is appropriate. These forests are described as Douglas-fir/hardwood forests. They were previously described by the Old-Growth Definition Task Group (1986) as Douglas-fir on mixed evergreen sites for the Klamath Mountains. For these zones in the low elevation, Douglas-fir forests are described as a mixture of Douglas-fir and hardwood trees. The hardwoods typically account for major percentages of stand basal area. Hardwoods may be tanoak, madrone, canyon live oak, chinkapin, white oak, or black oak. Conifers other than Douglas-fir account for minor percentages. Other conifers include ponderosa pine, incense cedar, sugar pine, and western redcedar. The different climatic and disturbance regimes, as well as the smaller size of hardwoods, influence the stand components of old-growth forests. Snag and log biomasses are low in comparison to Douglas-fir forests farther north where other conifers share dominance. Densities of large snags and large logs are also typically lower.

Bingham and Sawyer recommend expansion of the interim old-growth definition for Douglasfir on mixed evergreen sites developed by the Old-Growth Definition Task Group. The
interim definitions were minimum standards for certain stand structures. Bingham and
Sawyer provide average standards with 95 percent confidence limits as well as minimum
standards. The authors state that the minimum standards can be used as guidelines for
retaining features associated with old-growth when manipulating stands and view the averages
as more appropriate for identifying optimum old-growth conditions. Table 3 on the following
page represents the minimum and average standards from Bingham and Sawyer. The desired
future condition of these vegetative zones in the LSR would be represented by the average
values since the authors view them as identifying optimal old-growth conditions.
Management activities in younger stands would be prescribed to meet these average
conditions over time.

Table 3. Definitions for Old-Growth in the Douglas-fir/Chinkapin and Tanoak Vegetation Zones (Based on Bingham and Sawyer, 1991) DFC is based on exceeding the Average standards. Minimum standards shown for reference only.

Stand Characteristic	Minimum Standards	Average Standards
Live Trees		
Conifers ≥ 35 " dbh or ≥ 200 years old	≥ 6 per acre	12 ± 1 per acre
Hardwood basal area	≥ 10% of total BA	30% ± 5% of total BA
Intermediate and small size classes, Conifers and hardwoods ≤ 26' tall	> 10% total cover	25% ± 5% cover for hardwoods 2% ± 1% cover for conifers
Сапору		
Two distinct canopy layers: Douglas-fir over conifers and hardwoods	Upper tier > 130' tall Lower tier < 130' tall Canopy cover > 60%	Conifers ≥ 130' tall, 18 ± 1 per acre Conifers 40-130' tall, 16 ± 6 per acre Hardwoods 40-130' tall, 89 ± 17 /acre Canopy cover 71% ± 3%
Snags		
Conifer or hardwoods ≥ 4"	> 5 per acre	13 ± 2 per acre
Conifers ≥ 16" dbh ≥ 13' tall	> .1 per acre	2 ± 1 per acre
Down Logs		
Down logs	1 ton per acre	12 ± 4 tons per acre
≥ 17" diameter, ≥ 13' long	> 0.4 pieces per acre	10 ± 2 pieces per acre
≥ 17" diameter, > 50' long	> 0.1 pieces per acre	2 ± 1 pieces per acre

Old-growth Definition and DFC for the Grand Fir Vegetation Zone

A small portion, approximately 5%, of the LSR is in the grand fir vegetative zone or the mixed conifer zone for old-growth definitions. The major difference in the mixed conifer and western hemlock sites is the number of snags and amount of down wood. Once again, these definitions are based on the minimum standards to encompass nearly all old-growth stands and should not be taken as optimum for old-growth functions. Since the focus of the LSR is to protect and enhance late-successional and old-growth habitat, the desired future condition would exceed the interim standards. The desired condition would always be above the minimum through the best judgement of an interdisciplinary team, based upon the relative productivity and natural conditions. As more information is gathered, it can be added to this assessment.

Table 4. Definitions for Old-growth Douglas-fir on Grand Fir Sites (based on Old-Growth Definition Task Group, 1986) DFC is based on exceeding the Interim standards.

Stand Characteristic	Interim Minimum Standard
Live Trees	
Large trees	Douglas-fir, Ponderosa pine or Sugar pine > 30" dbh or > 200 years old ≥ 8 per acre
Intermediate and small size classes	White fir, Douglas-fir, or Incense cedar singly or in mixture
Canopy	Multi-layered canopy
Snags	
Snags > 20" dbh and > 15' tall	≥1.5 per acre
Down Logs	
Log biomass	≥ 10 tons per acre including 2 pieces per acre ≥24" diameter and > 50' long

Young and Mature Stand References

Bingham and Sawyer provide the only definition for live trees in young and mature stands for the vicinity of the LSR. They defined young and mature stands in Douglas-fir/hardwood forests by using ranges of means observed in the majority of the stands sampled. The ranges represent typical stand values and not minimums or maximums. These are provided for reference only and do not represent Desired Future Conditions.

Table 5. Live Tree Standards for Young and Mature Douglas-fir/Hardwood Forests (Based on Bingham and Sawyer, 1991) Provided for reference only.

Stand Characteristic	Young Stands (40-100 years)	Mature Stands (100-200 years)
Live Trees		
Trees 40 to 130' tall	Conifers 42 to 212 per acre Hardwoods 64 to 267 per acre	Conifers 24 to 87 per acre Hardwoods 48 to 134 per acre
Tree ≥ 130' tall	N/A	Conifers 12 to 24 per acre
Dominant stems < 18" dbh	Conifers 105 to 315 per acre Hardwoods 91 to 492 per acre	Hardwoods 103 to 308 per acre
Dominant stems 18 to 35" dbh	N/A	Conifers 16 to 28 per acre
Hardwood basal area	30 to 75% of total BA	15 to 45% of total BA
Сапору	iniches (1791) 33 (1815) (1816) (1816) (1816) (1816)	
Canopy	< 130' tall, single tiered Total cover 65 to 80%	< 180' tall, indistinct two tiered Total cover 65 to 80%

Coarse Woody Material and Snags in Young and Mature Stands

There are only two sources of information for coarse woody material and snags in young and mature stands. The Western Hemlock, Cool Douglas-fir/Hemlock, Grand fir, and Cold Douglas-fir vegetation zones are best described by Franklin and Spies. The Douglas-fir/chinkapin and tanoak vegetation zones are characterized by Bingham and Sawyer. These tables provide a reference for the development of mid and late seral stands leading to desired future conditions. Desired Future Conditions are given in Tables 2, 3, and 4.

Western Hemlock, Cool Douglas-fir/Hemlock, Grand fir, and Cold Douglas-fir Vegetation Zones

Coarse woody material information for young and mature stands for the western hemlock and mixed conifer sites are best described by Spies, Franklin, and Thomas. Their study of coarse woody material in the Oregon Cascades included the western hemlock zone and the northern margin of the mixed conifer zone. Dry sites had the lowest coarse woody material biomass, while moist sites had the highest. For old-growth stands, some of the lowest amounts were in stands on moderate sites in the southernmost part of the study area in the southern Oregon Cascades. Table 6 gives the average conditions for young and mature, as well as old-growth, stands. For Desired Future Conditions refer back to Tables 2 and 4.

Table 6. Snag and Down Log Standards for Young and Mature Douglas-fir Forests on Western Hemlock or Mixed Conifer Sites (Spies, Franklin, and Thomas, 1988) These are average conditions for these stands and not Desired Future Conditions.

Stand Characteristic	Young Stands (< 80 years)	Mature Stands (80-199 years)	Old-growth Stands (≥ 200 years)
Snags	Eliphinellagenelligespis		
Snags ≥ 4" dbh	81 per acre	44 per acre	24 рег асте
Snags ≥ 20" dbh > 16' tall	3 per acre	3 per acre	6 рег асте
Snags ≥ 20" dbh > 49' tall	l per acre	1 per acre	3 per acre
Down Logs			
≥ 4" diameter	245 per acre	167 per acre	169 per acre
> 24" diameter	22 per acre	13 per acre	26 per acre
% cover	10.6%	6.6%	10.0%

Douglas-fir/Chinkapin and Tanoak Vegetative Zones

Coarse woody material information for young and mature stands for the Douglas-fir/hardwood sites are once again best described by Bingham and Sawyer. Table 6 gives the average conditions for young and mature, as well as old-growth, stands. For Desired Future Conditions refer back to Table 3.

Table 7. Snag and Down Log Standards for Young and Mature Douglas-fir/Hardwood Forests (Bingham and Sawyer, 1991) These are average conditions for these stands and not Desired Future Conditions.

Stand Characteristic	Young Stands (40-100 years)	Mature Stands (100-200 years)	
Snags			
Snags ≥ 4"	18 to 55 per acre Hardwood snags 20 to 60%	14 to 50 per acre Hardwood snags 20 to 90%	
Snags ≥ 16" dbh ≥ 13' tall	.2 to 2 per acre	.2 to 2 per acre	
Down Logs		and the salaran publication of the companies.	
≥ 4" diameter	81 to 215 pieces per acre Hardwood logs 20 to 65%	91 to 156 pieces per acre Hardwood logs 45 to 75%	
≥ 17" diameter, ≥ 13' long	3 to 19 pieces per acre	.2 to 6 pieces per acre	
Biomass of snags and logs	4 to 22 tons per acre	2 to 13 tons per acre	

Summary of Desired Future Conditions

The following table summarizes the desired future conditions for the different vegetation zones of the LSR. For down logs, percent cover is much easier to quantify than tons per acre so it will be used for prescribing treatments. The recommended 8% cover of down logs probably over estimates the amounts found in southern Cascades stands since there are greater differences along the north-south temperature-moisture gradient than between young and old-growth forests (Carey 1995). Spies et al. found the percent cover of down logs in the Oregon Cascades to be 10%, with the smallest amounts found in the southern Cascades. The REO exemption criteria for density management cites research that indicates 8-10% cover for areas south of Drain, Oregon.

Table 8. Summary of Desired Future Conditions by Vegetation Zone As indicated in the table, these are minimum conditions.

	Western Hemlock Cool DF/Hemlock Cold DF	DF/Chinkapin Tanoak	Grand fir
Live trees	at least 8 DF per acre >32" or > 200 years old	at least 12 conifers ≥ 35" or ≥ 200 years old 30 % of the total BA in hardwoods	at least 8 DF, PP, or SP per acre >30" or > 200 years old
•	at least 12 shade tolerant trees > 16" per acre	25% cover for hardwoods < 26' tall; 2% cover for conifers < 26' tall	WF, DF, or IC intermediate or small size classes
	Multi-layered canopy	Two distinct canopies: DF over conifers and hardwoods.	Multi-layered canopy
Snags	at least 4 per acre > 20" and 15' tall	at least 13 conifer or hardwoods ≥ 4" at least 2 conifers ≥ 16" and ≥13' tall	at least 1.5 per acre > 20" and 15' tall
Down logs	≥ 8% cover including 4 pieces ≥ 24" and > 50' long	≥ 8% cover including 2 pieces ≥ 17" and > 50' long	≥ 8% cover including 2 pieces ≥ 24" and > 50' long

V. Landscape-Level Criteria for Developing Appropriate Treatments

Based on the analysis of the existing habitat conditions within the LSR, as well as the individual recommendations for treatments, three general landscape criteria were identified for setting priorities for the location of future treatment areas:

- 1. Maintain and enhance connectivity across the landscape
- 2. Promote the establishment of large blocks of late-successional habitat
- 3. Enhance spotted owl habitat conditions around centers of activity

Often these criteria overlap, which could result in high priority treatment areas which meet more than one need. There may also be isolated smaller treatment needs which would be handled on a site-specific basis. The following discussion provides an overview of the major facets of the three criteria with recommendations for how they should be implemented:

1. Maintain and enhance connectivity across the landscape for plant and animal species associated with late-successional and old-growth forest habitat.

Analysis of existing data and maps identify important existing connectivity areas, areas with low connectivity, or barriers to species moving across the landscape. Connectivity of late-successional habitat identified with the aid of a photo of the LSR and seral age class maps is the best way to appreciate the connection of late-successional blocks and the relationship to topography. Topography is important because knowing where connectivity is lacking or present in relation to riparian systems or uplands can make a difference on the success of connecting late-successional blocks. Because of the checkerboard ownership in the BLM portion of the LSR, connectivity of the remaining older forest stands is very important. Even birds, which are capable of straight line flying, require connectivity of habitat for movement. The ability to move within the forest from one place to another becomes more important to species that require or have dependency on the older age classes, have small territories, or move along the ground.

Specific evaluation identifies:

- existing habitat in areas that provides connectivity (e.g. stream buffers, patches of late-successional habitat, mid-seral stands).
- existing barriers to connectivity
- stands that could provide late-successional habitat within 10-40 years.
- areas where treatment is needed to ensure establishment and survival of conifers following timber harvest or other disturbance.

Specific areas which were identified under these criteria include:

Because of topography, the pattern of land management, and existing stands, the northern portion of the LSR is key to connectivity across the landscape. This area connects with LSR 259 to the west and the block Forest Service ownership to the east. It also connects the Coast Range and Siskyous with the Cascades.

The central area of the Medford District portion of the LSR, has very little late-successional habitat and currently provides less opportunities for connectivity across the landscape. This area contains wider valleys in private ownership and more scattered parcels managed by the BLM. However, there are many areas of the BLM capable of providing connectivity and late seral habitat in 10-40 years.

The area burned by the 1987 Bland Mountain fire on the Roseburg District BLM. This stand replacement fire interrupted the connectivity across the LSR that previously existed.

Any early seral stand due to harvest of timber now lacks connectivity and latesuccessional characteristics.

Considerations based on maintaining and enhancing connectivity:

Maintain connectivity across the northern portion of the LSR. The area of checkerboard ownership pattern in the Roseburg District is the key area. See Map 8, page 29. Any early seral stand as a result of timber harvest or disturbance, not yet functioning as connectivity, can be treated to develop toward late-successional characteristics. Mid seral stands of single story even-aged Douglas-fir could be treated by density management to develop additional late-successional characteristics. Treatment would only occur if there are areas of young stands that would benefit from treatment and if at the landscape and stand level, connectivity is maintained. Mid seral stands that are of multi-level and include hardwoods would not require treatment. (See stand level criteria)

Stands within the 50 to 70 year age class that provide connectivity between late-successional blocks in the southern half of the LSR could be treated to enhance future late seral habitat. Stands in these age classes would be more likely to have reached an average stem size and density that would benefit from density management. At this time, because of current vegetation, connectivity is not as critical through the southern half of the LSR. These stands will develop and connectivity will be enhanced in the future by treatment.

The Bland Mountain fire is a large area to treat young (early seral age) stands within the LSR. Stands burned in the fire and replanted are between five and ten years old and are approaching density management size.

Stand replacing fires such as Bland Mountain could occur anywhere in the LSR. Risk

reduction activities, mostly in younger stands, could take place to reduce the risk of habitat loss and to maintain existing connections over the next few decades. (See the Risk Reduction section.)

2. Promote the establishment of large blocks of late-successional habitat.

Promote large blocks of interior habitat greater than 200 acres. Interior habitat is defined as late-successional habitat at least 400 feet from the edge of a block. This means that patches less than 15 acres would have no interior habitat and to have 200 acres of interior habitat, the patch would have to be over 300 acres in size.

Specific evaluation identifies:

- existing large blocks of late-successional habitat and interior habitat which have the greatest potential for enhancement. Priority blocks are larger than 200 acres that may have inclusions of mid-seral stands.
- existing large areas of mid-seral stands, which have inclusions of late-successional patches.
- existing areas within the LSR where large blocks of late-successional habitat do not currently exist.

Considerations to promote large blocks of late-successional habitat:

Inclusions of mid-seral stands could be treated to create late-successional characteristics within the next 10-40 years. This would increase the size of the late-successional block, while maintaining the habitat function of surrounding stands.

Treatment of large areas of mid-seral stands could result in large late-successional blocks within 10-40 years, particularly in the south central portion of the LSR on Medford BLM. There is also an area along the northern boundary of the LSR on the Roseburg District outside the main connectivity corridor.

Select large blocks of early seral stands (<20 years) for treatment which would develop into late-successional habitat, such as the Bland Mountain fire area. Previous harvest units also are concentrated in some areas to form large blocks of similar age stands.

3. Enhance spotted owl habitat conditions around centers of activity.

Within the provincial radius of spotted owl activity centers (1.3 miles) maintain and promote spotted owl habitat with the objective that all sites have 75 percent of LSR lands in the circle in suitable spotted owl habitat (nesting, roosting, or foraging habitat).

Analyze existing suitable habitat around owl sites, along with productivity of the sites,

connectivity of the suitable habitat to other suitable habitat in the vicinity, and location of the site on the landscape. The best nesting, roosting, and foraging habitat would be maintained first, then the dispersal habitat. Activity centers are generally late-successional habitat but may include younger stands. Nesting, roosting, and foraging habitat would not be treated. Treatment of younger stands within the activity center could be considered.

This site information can form the basis for creating a priority list of owl sites. The list can be used to determine which owl sites require active management to increase habitat within the home range or increase connectivity of habitat by manipulating forest stands to accelerate the development of young stands toward late-successional stand characteristics. The treatment or type of stand manipulation may differ based on the particular factor deficient near individual owl sites.

Knowledge of the owl sites involved and the associated owl and forestry data is important for the reasons listed below.

- Stand manipulation within the LSR still requires "may affect" determinations under the ESA of 1973 as amended. Whether the impact is negative, positive, or neutral, on the spotted owl or critical habitat, a "may affect" determination must be done by the BLM or Forest Service prior to project implementation. This can be done with knowledge about the owl sites, home range, current forest stand ages, and distribution of stands on the landscape.
- Each owl site should be evaluated individually. What is good for one site may not be good for another site. Evaluation should be conducted primarily by wildlife biologists but should include input from silviculturists to ensure that proper methods and prescriptions are developed and that goals can be achieved.
- Goals of the forest stand manipulation should be tied to and based on the analysis of the data previously discussed.

An example of a priority list for the South Umpqua River/Galesville LSR is given in Appendix D, Tables D-1 and D-2. Table D-1 displays the acres and percent of suitable habitat present within the 1.3 mile radius around each owl site. Table D-2 provides ranking of the sites by occupancy, acres, history, and other data useful in evaluating each site.

Considerations around spotted owl activity centers

Core areas would generally be late-successional habitat and not be treated. Lower ranked owl sites in Appendix D would have higher priority for treatment to improve habitat than higher ranked sites. Priority would be given first to early seral stands for precommercial thinning, then to mid-seral stands.

Specific areas identified under this criteria include twenty-five owl sites which contain less than 30 percent suitable habitat within 1.3 miles. This is at least 10 percent below the guideline. These sites should be considered first for evaluation.

Priority Areas Based on Landscape-level Criteria

After evaluating all three landscape criteria, it appears there are a few areas which may be high priority for treatment because they meet more than one of the identified needs. These areas are:

- the Bland Mountain fire area of the Roseburg BLM
- the central portion of the Medford BLM part of the LSR
- the owl sites below the 30 percent suitable habitat level and in or near an area identified under landscape-level criteria one or two listed above
- · any early seral stand
- · mid-seral stands that would benefit from treatment to achieve late-successional characteristics

These areas are shown on the following map.

Risk reduction activities would consider the landscape criteria indicated above, as well as ownership and topography. Activities would generally be planned to reduce risk of habitat loss and loss of function at the landscape level. Treatments, however, would primarily be conducted at the stand level and would be designed to lessen the effects to desired stand conditions such as coarse woody material and number of snags.

Insert Map 9 - Landscape Level Priority Treatment Areas

VI. Stand-Level Criteria for Developing Appropriate Treatments

Late-successional reserves are to be managed to protect and enhance late-successional and old-growth forest ecosystem conditions. Appropriate treatments can be divided into four categories: silviculture actions for attainment of late-successional habitat conditions, risk reduction, salvage, and other nonsilvicultural activities. The ROD encourages the use of silvicultural practices to accelerate the development of overstocked young plantations into stands with late-successional and old-growth forest characteristics. Risk reduction efforts are encouraged where they are consistent with the overall recommendations in the Standards and Guidelines of the ROD.

Silviculture Actions for Attainment of Late-Successional Habitat Conditions

According to the ROD, silvicultural systems proposed for the LSRs have two principal objectives: 1) development of old-growth characteristics including snags, logs on the forest floor, large trees, and canopy gaps that enable establishment of multiple tree layers and diverse species composition; and 2) prevention of large-scale disturbances by fire, wind, insects, and diseases that would destroy or limit the ability of the reserves to sustain viable forest species populations. Silviculture actions can assist in meeting the first objective. The second objective can be met by risk reduction activities that are described later. Any stand level treatments also fall within the landscape level criteria previously described.

The young stands of the LSR were predominantly established following fire or timber harvest. Some of these stands will develop old-growth characteristics without silvicultural intervention. However, current stocking and structure of some of these stands were established to produce high yields of timber, not to provide for old-growth-like forests. Consequently, silviculture can modify the developmental trajectory of young stands into multilayered stands with large trees and diverse plant species, and structures that may, in turn, maintain or enhance species diversity.

Stand management in LSRs should focus on stands that have been regenerated following timber harvest or stands that have been thinned. Stands that have developed naturally following stand replacement fires often have the same characteristics as managed stands (single canopied, single species, low within stand diversity) and could also receive stand management. The overall criteria for silviculture treatments is that they are beneficial to the creation of late-successional forest conditions. There are many acres in the LSR that are currently not in a late-successional or old-growth condition, but are capable of developing into those conditions. Silvicultural manipulation of younger stands can accelerate the development of desired stand characteristics. Depending on stand conditions, potential treatments could include reforestation, release, density management, pruning, fertilization, and tree culturing. These are detailed in Section IX. - Restoration Forestry. Criteria from the REO to exempt specific silvicultural activities from review are in Appendix F.

Silviculture Actions Effect on Connectivity Habitat

Since this LSR, and most importantly the northern portion of the LSR, is in a critical east-west connectivity area between the Cascades, Siskiyous, and Coast Range, maintaining connectivity at both the stand and landscape levels is important when considering treatment opportunities. With 50 percent of the federal lands of the LSR falling in the category of young stands, the amount and distribution of these stands is inconsistent with the desired conditions. It will take more than 40 years for these young stands to grow into late-successional habitat and reach the desired condition of at least 60% of the LSR in late-successional habitat. Treatments to accelerate stand conditions to late-successional characteristics should occur while balancing the need to maintain connectivity.

For the northern portion of the LSR (Roseburg BLM lands in the corridor), overall landscape function, as well as stand-level function, of dispersal habitat must remain following stand-level treatment. Entire stands would not be treated in order to maintain stand-level connectivity through this corridor. For the southern portion of the LSR, connectivity must function at the landscape level following treatment.

The emphasis for treatment will be on even aged stands that have been regenerated following timber harvest or have been thinned or even aged unmanaged stands. An interdisciplinary team process would consider many aspects of a project design before final implementation. Project development could incorporate other features, such as neotropical bird nesting habitat, into a project design through seasonal restrictions. The team would develop the project so that its final design meets the objective of achieving late-successional habitat conditions earlier than if the project were not implemented.

There may be negative short term effects to late-successional forest related species on a given piece of ground. These would be outweighed by the long term benefits. For example, a density management treatment frequently reduces the canopy closure in parts of a stand to 50-60 percent. Within ten years, the canopy has expanded back to a nearly closed canopy and that impact is negated, and other benefits are gained to components of the stand. North slopes would also respond quicker than south slopes.

For the southern portion, when connectivity is not maintained at the stand level, a site specific analysis should indicate that connectivity habitat is not limiting in the surrounding area, and will not be limited following treatment. The quality, quantity, and spatial arrangement of the connectivity habitat would be considered. Within the checkerboard pattern, private lands would also be considered. A mid-seral density management would not occur next to a private regeneration cut.

Tree growth simulation models, such as Organon, could be used to assess the desirability of applying a silvicultural practice to a stand. In these cases, plots would be taken and the

effects of the proposed action would be compared with projected stand development if the management action were not implemented. If it cannot be demonstrated that the action would significantly speed up the development of late-successional character, or maintain components of the action would not take place.

Other older stands, such as those in the Modified Older Stand category which do not currently exhibit late-successional characteristics, could be managed using many of the same management practices as described for younger stands. The intent of the treatment would be to promote the rapid establishment of a diverse and multi-layered canopy and other late-successional characteristics.

Treatment Acres and Priority by Seral Stage

The following are approximate acres and priorities for treatment within the seral stages for the next ten years. Locations of these seral stages are shown on Map 3. Actual treatment acres would probably be less. Reforestation treatments would occur following stand replacement events and are not estimated. Interplanting, maintenance, and release would be conducted as needed to ensure successful reforestation.

The acres in the following table are not additive. Many treatments occur on the same acres. Fertilization occurs on a portion of the same acres as density management. Pruning and tree culturing occur on the same acres as density management, though on a small number of trees per acre.

Table 9. Approximate Acres of Proposed Treatments in the Next 10 Years Only the midseral density management is treated differently whether in the connectivity corridor or not.

Currente in the Seral Stage In t	Tederal Acres	Approximate Treatment Acres Next 10 Years	Priority
Grass/Forb/Shrub (0-10 years)	10,876	4,350 - Density Management 1,500 - Fertilization	High
Sapling/Pole (11-40 years)	13,877	2,700 - Density Management 1,000 - Fertilization 3,000 - Pruning, Tree culturing	High
Mid-Seral (41-80 years)	8,145	2,000 - Density Management (500 in Northern Connectivity 1,500 elsewhere) 2,000 - Tree Culturing	Low

Within the next 10 years, the acres now in the Grass/Forb/Shrub seral stage (0-10 years of age) will be coming on line for possible treatment by density management (precommercial thinning). A very small percentage of these acres have already been treated. These stands are not functioning as connectivity habitat at the present time and are a high priority for treatment. For this age of stands it does not matter if they are in the connectivity corridor or

not. The majority of these stands have been regenerated following timber harvest.

For the sapling/pole stage (11-40 years of age), only those acres in the youngest ages would be a high priority for treatment by density management and a portion of those for fertilization. Those acres that are 20 to 40 years old would generally not be treated by density management because they have not reached a size to make the treatment economical. These stands are still not functioning as connectivity habitat and no differentiation is made for the corridor. Pruning could occur on 3,000 acres, but on a low number of trees per acre. There are probably only 50 to 100 sugar pine or white pine per acre in conjunction with other species. Tree culturing could be done in conjunction on an even fewer number of trees.

As the stands age into the mid-seral stage, the stands would be looked at again for possible density management (commercial thinning). Some of these stands have had past management, others are the result of old fires and natural regeneration. Most of these stands are currently functioning as connectivity habitat and may be on an acceptable trajectory to reach late-successional habitat, however, opportunities exist to accelerate stand development in some stands. Fewer acres would be treated in the northern connectivity corridor. Though the priority is low, this does not imply that there will not be management activities in these stands. Tree culturing would be done in conjunction with density management but to only one or two trees per acre.

See Section IX. - Restoration Forestry for more detailed information on stand selection and treatments.

Spatially, the mid seral density management opportunities are shown on Map 8. The age classes for dispersal habitat (41-80 years) also approximate where density management could occur depending on stand characteristics. The first proposed density management in the northern portion of the LSR would occur just north of the connectivity corridor. No plans have been made yet for any stands within the corridor.

Coarse Woody Material and Snag Criteria for Managed Stands

The following criteria would provide guidance for coarse woody material (CWM) and snag retention following density management treatments. These criteria are not site specific silvicultural prescriptions but could be used for developing recommendations.

The following is the Desired Future Conditions from Table 8 for CWM and snags.

	Western Hemlock Cool DF/Hemlock Cold DF	DF/Chinkapin Tanoak	Grand fir
Snags	at least 4 per acre > 20" and 15' tall	at least 13 conifer or hardwoods ≥ 4" at least 2 conifers ≥ 16" and ≥13' tall	at least 1.5 per acre > 20" and 15' tall
Down logs	≥ 8% cover including 4 pieces ≥ 24" and > 50' long	≥ 8% cover including 2 pieces ≥ 17" and > 50' long	≥ 8% cover including 2 pieces ≥ 24" and > 50' long

Coarse Woody Material

The stands considered for density management have developed both through natural processes as the result of stand replacement fire and as a result of timber harvest. The focus of density management would be on stands that have had past management. Levels of CWM in these stands is generally low due to removal in the previous regeneration harvest. There would be a need to create CWM in the short term in these managed stands. Stands that developed following stand replacement fires may contain larger amounts of down wood, but should be evaluated to see if there is a need to add down wood.

In most stands being considered for density management there are very few large trees that would serve the purpose of large snags or CWM. The large trees that do exist should be left on site to develop into large overstory trees. The desired levels of large down wood found in natural stands cannot be created at this stage of stand development. The goal would be to add dead wood at levels that would contribute to meeting the desired level as the stand develops.

The desired level for CWM would be 8 percent cover of down logs including pieces greater than the given diameter and length shown in the appropriate vegetation zone. However, trees of this size are generally not available at the time of first entry in a density management. Inventory plots on the Roseburg District in the vicinity of the LSR indicate average diameters (for trees ≥7") of only about 14" at 60 years of age. The goal is to manage for these levels of down logs through time, not just at the time of treatment. Within five years following density management, the goal would be to provide the additional cover if needed towards reaching the eventual goal of 8%. At least half the down logs would be of a diameter equal

to or greater than the average stand diameter.

The recommended 8 percent cover of down logs probably over estimates the amounts found in southern Cascades stands since there are greater differences along the north-south temperature-moisture gradient than between young and old-growth forests (Carey 1995). Spies et al. found the percent cover of down logs in the Oregon Cascades to be 10 percent, with the smallest amounts found in the southern Cascades. The REO exemption criteria for density management cited research that indicated optimum levels of 8 to 10 percent cover for areas south of Drain, Oregon.

For CWM and density management, the following criteria would be used:

- 1. Perform adequate transects as a survey for existing percent cover of CWM in the treatment area. This could be done in conjunction with the stand exam done for developing the density management prescription.
- 2. Reserve all CWM that was present prior to the density management project and protect as much as possible from yarding disturbance. Leave additional green trees if surveys suggest a need to add additional CWM later.
- 3. Following the density management treatment, perform another survey to determine the percent cover of CWM post treatment.
- 3. Within five years following density management, provide additional logs to reach the desired 8 percent cover. Larger trees would be left to develop into overstory trees. For additional down wood, consider the treatment objectives, location, size, and concentration of existing CWM, and specific wildlife needs. (At age 60, approximately 6 trees per acre would be needed to provide an additional 1% cover for large wood. At age 80, approximately 5 trees per acre would be required. These numbers are based on trees of the average stand diameter being felled for CWM.)

Snag Retention

The stands considered for density management that have developed as a result of timber harvest are generally low in snag density. Snags were typically felled in the regeneration harvests. Stands developing as a result of stand replacement fire may have remnant snags remaining in the stands. With the focus of density management on stands that have had past management, there would be a need to create snags in the short term in these stands.

In most stands being considered for density management there are very few large trees that would serve the purpose of creating large snags. Snags being created in the stands as a result of suppression mortality are in the smaller diameter classes. These snags have little value and last for only a short period in the stand. The large trees that do exist should be left on site to develop into large overstory trees. The desired levels of large snags found in natural stands cannot be created at this stage of stand development. The goal would be to create snags of sufficient size that would meet an interim need until tree sizes develop to meet the desired level. The final goal being snags at levels to support species of cavity nesting birds at 100 percent of potential population levels.

For western hemlock sites, the desired level for snags would be at least 4 snags per acre greater than 20" diameter and greater than 20' tall. For the mixed conifer and Douglas-fir/hardwood sites, the desired level for snags would be at least 2 snags per acre greater than 20" diameter and greater than 20' tall. These numbers are consistent with Roseburg BLM inventory data showing 2.6 snags per acre averaging over all zones. Trees of this size are generally not available at the time of first entry in a density management. Inventory plots on the Roseburg District in the vicinity of the LSR indicate average diameters (for trees ≥7") of only about 14" at 60 years of age. A density management treatment would leave enough trees to grow into large snags as well as large trees. Following the density management, additional snags would be provided to meet a short term goal.

For snag retention and density management, the following criteria would be used:

- 1. During the stand exam done for the density management prescription, survey for existing snags.
- 2. All remnant snags would be retained where they do not present a safety problem. Leaving areas of unthinned trees around the snags would facilitate their retention and lessen the safety concern. To advance toward the Desired Future Condition, leave at least 2 additional green trees per acre chosen from the average diameter class to create additional snags later.
- 3. During the density management operation, some trees may become broken topped or girdled. Leave these trees to become snags and add to structural diversity.
- 4. Within five years following density management, provide snags in the average diameter class of the post treatment stand to reach the Desired Future Condition level per acre. Larger trees would be left to develop into overstory trees. For created snags, consider the treatment objectives, location, size, and concentration of existing snags, and specific wildlife needs. Based on the individual stand conditions, some larger trees may be girdled to provide the larger snags.

VII. Risk Reduction

The quantity and quality of late-successional habitat is changed through disturbance events such as wildfire, disease, insects, windstorms, and soil movement. Large-scale disturbance events can effectively eliminate or change late-successional habitat on hundreds if not thousands of acres. Small-scale disturbance events due to overstocked stands, disease, or insects, cause habitat loss at the stand level. While the risk of habitat loss cannot be eliminated, risk management activities may reduce the probability that major stand-replacing events or events that lessen habitat quality will occur. The primary purpose of risk reduction activities in this LSR is to reduce the probability that large-scale late-successional habitat loss (and the functions, such as connectivity, it provides) will occur. Particular importance will be given to conducting risk reduction activities designed to maintain major east-west connectivity corridors. Following that, the primary purpose of risk reduction activities will be to reduce the probability of late-successional habitat loss in stands with important features such as nest stands for northern spotted owls, stands with other key species, or stands that contain larger blocks of interior habitat or those providing meaningful localized connectivity. Prescribed fire can be used for fuels management and risk reduction. There may also be opportunities to use prescribed fire to manipulate habitat or maintain habitat components.

Management Actions for Risk Reduction

Silvicultural activities to reduce risk will generally focus on younger stands within the LSR. The objective of the treatments will be to make the stand and/or landscape less susceptible to natural disturbance, especially fire. Activities for risk reduction in older stands may be appropriate however, if: proposed activities will clearly result in greater assurance of long-term maintenance of habitat and habitat function; the activities are clearly needed to reduce risks; and the activities will not prevent the LSR from playing an effective role in the objectives for which they were established. Risk reduction activities in both younger and older stands generally introduce short-term increases in the risk of late-successional habitat loss. Short-term increases in risk should be evaluated against the value of long-term risk reductions.

Priority for risk reducing treatments will be based upon: the degree to which the stand(s) is currently functioning for connectivity or as late-successional habitat; stand condition and trend; relationship to the connectivity corridor; and location in regards to ignition source. Treatments may be direct (done within a stand) or indirect (done to adjacent or nearby stands). The priority would be to protect the best functional habitats "indirectly". While highest priority for risk reduction treatments would focus on maintaining the major east-west connectivity corridor, actual treatment may involve stands outside the corridor that are not currently functioning for connectivity. The treatment would be designed to keep fire from spreading into the corridor should a wildfire occur. The following table gives priorities for risk reducing treatments within the LSR. Areas that have greater numbers of ignition sources such as along major roads, near the Galesville Reservoir, adjacent to homes would have a higher priority for treatment than areas with few ignition sources.

Table 10. Risk Reduction Protection Priorities. Priorities were established to maintain quality connectivity habitat where it exists or will soon exist. Areas not currently functioning as connectivity or late-successional habitat have a lower priority.

Risk Reduction Protection Priority				
Currently Functioning for Connectivity or Late- Successional Habitat?	Stand Condition/ Trend	Protection Priority		
yes-good	stable	very high		
yes-marginal	stable	high		
no	stable	low		
yes-good	improving	very high		
yes-marginal	improving	high		
no	improving	medium		
yes-good	declining	high		
yes-marginal	declining	medium		
no	declining	low		

^{1 -} This table depicts priorities for risk reducing treatments only. If the objective includes improving connectivity or late-successional functioning treatment priority may change.

Some salvage that does not meet the salvage guidelines would be allowed if it is essential to reduce future risk of fire or insect damage to late-successional forest conditions. The focus would be on areas where there is a high risk of large scale disturbance. In these cases the value of reducing the risk of future loss of late-successional habitat should be weighed against the value of snags or downed trees as habitat structures.

Wildfire Risks

As wildfire presents the greatest risk of late-successional habitat loss in this LSR, the majority of risk reducing activities done will be aimed at managing fuels and sources of ignition. Past treatments designed to establish conifers and to improve conifer growth have increased and modified fuels. Silvicultural treatments designed to accelerate the development of or create characteristics of older forests will further modify fuels and have the potential of increasing fuel levels. During treatment fuels change from living fuels to dead fuels. Fuels move from different canopy levels to near the ground. Fuels tend to accumulate with repeated treatments. Factors affecting fuels include: stand age and density, spacing and size of material within the stand, stand structure including presence of understory vegetation, and treatment or activity. Fuel associated risks can be categorized as either short-term or long-term depending upon the size of the fuel. Management may be direct by treating existing

^{2 -} Other factors being equal, give greater weight to degree to which area provides connectivity.

"natural" fuels, and/or fuels created by stand management operations through treatments such as prescribed burning, chipping, or small sales. Management may also be indirect through treatments such as those designed to maintain or enhance stand vigor or change stand structure. Risks and benefits will have to be balanced in that the fuels that contribute to the risks of habitat or habitat function loss are the same that contribute to the benefits of coarse woody material.

Management of Fuels Associated Short-Term Risks

Short-term risks of habitat and function loss are generally associated with fine fuels. Fine fuels are those three inches in diameter or less. They can be classified as "short-term" as these fuels decompose relatively fast, in years as opposed to decades. Fine fuels generally decompose to a point where their influence on the rate of fire spread has returned to preactivity levels within 3-15 years within this LSR. Factors influencing decomposition rates include: species, temperature/moisture regime, amount, size, and sunlight. These fuels are an important consideration in the risk of a fire event as they are the component of the fuel profile that most influences the rate that a fire will spread.

Fine fuel levels within the LSR are a concern. Areas with shorter "historic" fire frequency intervals (hotter, drier, southerly slopes) have experienced the greatest change in accumulated fine fuel levels. These areas are well outside "historic" norms and present some of the greatest opportunities to reduce short-term risks. Fine fuels were those typically "controlled/managed" by periodic low intensity natural fires. Expected fine dead fuel loadings resulting from treatment of young stands (such as brushing, release, and density management) typically range between three and twenty-five tons per acre depending on the size of material cut and follow-up fuels reduction treatments. Additional factors with density management include the number of trees removed from the stand and the number of small openings created.

General management strategy: reduce fine fuels in areas where fire suppression or land treatments have allowed fuels to accumulate to unacceptable levels; avoid the creation of additional fine fuels in areas that have high ignition probabilities, disperse elsewhere; reduce fine fuels if risks are unacceptable (high use areas, areas with important resource values). Consider the historic fire interval when developing fine fuel target levels.

Treatments to Reduce Short-Term Risks

- 1. Potential treatments that reduce amounts of fine fuels include, prescribed burning (underburning/ broadcast burning, handpiling and burning piles, and swamper burning), yarding, or sale of material for fuel or other purpose. Prescribed burns should be "cool" burns that maintain soil organic matter and organisms and when possible should mimic the effects that naturally occurring non-catastrophic fires produce.
- 2. Dispersing fuels through lopping and scattering or chipping to get them closer to the ground so that they can decay faster and to reduce flammability.
- 3. Disperse concentrations of fine fuels so that intense fires will not move across the landscape.
- 4. Creation of "fuel-reduced" buffers or areas along major roads, next to private property,

or in other areas of high risk. An example of a "fuel-reduced" buffer would be that created by handpiling and burning the piles within 100 feet of a heavily traveled access road.

Treatments to reduce short-term risks were exempted from future REO review.

Management of Fuels Associated Long-Term Risks

Long-term risks of habitat and function loss are generally associated with larger (>3" in diameter) dead fuels. These fuels remain on the site longer and increase the difficulty of fire control. Increasing amounts of large fuels increases fire intensity and duration and increases the probability of crown fires and of habitat and function loss. Heavy equipment may be necessary to construct fire lines. The greater the amount of large fuels, the greater the probability that heavy equipment will be needed.

Levels of these larger fuels, while still an important risk management consideration, are not as much a concern as fine-fuel levels. Snags and coarse woody material (CWM) are an important part of late-successional habitat.

General management strategy: avoid creation of undesired levels of larger fuels in areas that have high ignition probabilities; design treatments to avoid future wildfire control problems; create/maintain stand structure/vigor so that the likelihood of a running crown fire is reduced.

Treatments to Reduce Long-Term Risk

- 1. Avoid creation of undesired medium and large size fuels (e.g., CWM) on southerly slopes, near high use areas, and in areas adjacent to private property.
- 2. Where additional larger fuels (CWM and snags) are desired, disperse creation both spatially and temporally.
- 3. Consider the effects that additional larger fuels in an area would have on fire suppression efforts. Avoid creation of additional CWM in areas where fire lines would likely be created.
- 4. Thin (density management) stands to reduce the threat of a running crown fire. Stands with spacing greater than 20' X 20' have considerably less risk of sustaining a crown fire than stands that are more closely spaced.
- 5. Prune tree boles and treat understories to remove or reduce fuel ladders.
- 6. Reduce slash and other undesired fuels through prescribed burning or other treatments.
- 7. Create fuel breaks or shaded fuel breaks.
- 8. Create/maintain low-impact water sources.

Treatments to reduce long-term risks would be subject to future REO review.

Management of Ignition Source Risk

Management of ignition source risk will primarily be through control of access to stands, timing of operations, and timing of other uses within the LSR. Access may be physically restricted through the decommissioning, blocking, or gating of roads. Operations or other

uses within the LSR may be clustered, for example having several contractors or crews work in close proximity to each other. In that way if a fire was started, there would be a larger number of available personnel and equipment nearby to suppress the fire. Operations can be timed to avoid the hottest and driest periods of the year. Exceptions may include density management of young stands near blackstain centers or treatments in areas susceptible to the build-up of bark beetles or other undesired insects. In these areas low live moisture content of the wood and quick drying of the slash may be desired. Other uses can also be timed to avoid the hottest and driest periods of the year.

General management strategy: control access during hottest and driest periods of the year; cluster operations or other uses; and physically restrict access on BLM and FS controlled roads by decommissioning, blocking, or gating where appropriate.

Habitat Manipulation Through Prescribed Fire

While prescribed fire will for the most part be used to manage fuels within the LSR to reduce the risk of habitat loss from wildfire, opportunities may arise where prescribed fire could be used to manipulate habitat or maintain habitat components. Examples include: seedbed preparation where natural regeneration is desired; reduction of understory vegetation to maintain or improve the vigor of overstory conifers particularly large pines; and burning of meadows and areas incapable of becoming late-successional forest to encourage prey base for great gray owls, to serve as suitable foraging areas for various species of bats, and for forage production for big game where late-successional habitat is not adversely affected.

General management strategy: be consistent with LSR objectives, projects should be considered if they provide late-successional habitat benefits or if the effect on late-successional associated species is negligible; implement treatments that pose very little risk of reducing the quality of surrounding late-successional habitat; view projects from a long-term habitat quality and landscape perspective; and look for opportunities on lands incapable of becoming older forest.

Estimate of Risk Reduction Treatment Acres

Approximately 5,000 acres of risk reduction or habitat manipulation with fire could occur in a decade. Fuels/risk reduction treatments would make up about 80% of the treatment acres with 20% in habitat manipulation. These acres would include all types of activities, such as prescribed burning to reduce ground fuels and fuel ladders, dispersion of fuels, creation of buffers and fuel breaks, or burning of meadows.

Other Disturbance Agents

Risk of large-scale habitat loss from disturbance agents other than fire is relatively low. As it fits with overall LSR objectives (e.g., snags, coarse woody material), risk reduction activities for these agents will generally have as an objective maintenance or enhancement of stand

vigor and resiliency. Management activities will tend to focus on younger stands and will consist primarily of density management operations (and associated fuels treatments). Density management will also provide opportunities to create structural elements found in older forest stands. Aerial fertilization as it fits with other resource objectives such as maintenance of water quality may be done to improve stand vigor and resiliency.

In most stands, vegetation will be managed so that diseases present are retained within what is judged to be endemic or "historic" levels. Density management and other treatments to improve stand vigor will be the primary treatments. Aerial fertilization may be done. For at least the conifer species, current theory holds that soil nutrient deficiency leads to an increase in the proportion of energy allocated to the growth of small roots and a corresponding reduction in energy allocated to foliage and stem growth. If this situation is chronic, tree vigor (expressed as wood growth per unit of foliage) may remain below normal leading to increased susceptibility to attack by insects and disease (Waring 1987). A correlation between low levels of certain soil nutrients and the presence of infection (Singh 1983) and decay (Shield 1979) has been found. In many cases though, the management may be no treatment. For diseases such as blackstain, operations will be timed to minimize activityrelated spread of the disease. Dwarf mistletoes will be managed so that their natural function in stands is retained but their presence does not jeopardize the attainment of LSR objectives. In stands that have important features and in stands that are important because of where they are located for connectivity, interior habitat, etc., risk reduction treatments will have an additional objective to reduce the effects of the disease over the long-term.

Non-native diseases will be managed to prevent the spread of the disease to uninfected areas and to maintain native stand components. In the case of white pine blister rust, treatments may include planting of disease resistant seedlings and cultural practices such as pruning of cankers or lower limbs in conjunction with precommercial thinning or release.

Stand conditions will be managed so that insect population levels do not prevent LSR objectives from being attained. Density management and other treatments to improve stand vigor will be the primary treatments. Treatment timing will include consideration of potential increases in insect numbers that result from having green slash in the area during the spring. A concern is that should a major windthrow event occur, large numbers of green, downed trees may attract and allow insect populations to increase to a point where additional habitat is lost as nearby standing trees are attacked and killed. Salvage of downed trees may be prescribed.

Treatments of noxious weeds and other introduced species will be designed to reduce or eliminate their effect on late-successional habitat, habitat function, and habitat formation. Treatment methods will consist of those methods described in current BLM and Forest Service noxious-weed related decision documents.

VIII. Salvage Guidelines

Tree mortality is a natural process in a forest ecosystem. Dead and damaged trees are key structural components of late-successional forests. However, excessive amounts of coarse woody material may create a high risk for future stand-replacing disturbances. Management activities, such as salvage, following events creating excessive amounts of coarse woody material should be designed to accelerate or not to impede the development of late-successional forest conditions.

Salvage involves the removal of some forest components (i.e. green standing trees not likely to survive, dead standing trees, live or dead blown over trees) after an event like fire, wind, insect or disease outbreaks, or other natural events. These stands may have various levels of trees blown down, scorched, standing live and dead, etc. based on the intensity of the event. The goal here is not to list every possible salvage scenario but to outline the likely options that may help "protect and enhance conditions of late-successional and old-growth ecosystems" (ROD) after a forest disturbance. All salvage projects should be evaluated on site by area specialists applying the possible scenarios and actions listed below:

- 1. Disturbed areas equal to or less than 10 acres, or disturbed stands where canopy closure remains greater than 40 percent should not be considered for salvage if the area is adjacent to late-successional stands and not substantially connected to a previous opening. Disturbed areas less than 10 acres may be salvaged only if a risk reduction evaluation indicates a need to salvage to meet LSR objectives or if the disturbance event created openings that are substantially connected to recent, previous openings. (Also refer to "Management Actions for Risk Reduction" section, page 64).
- 2. Individual or groups of trees along roads, trails, or recreation sites may be salvaged if it is determined that they pose a hazard to people using the area. Salvage of down trees along roads, trails, or in recreation sites may also occur if the trees are blocking or are an obstruction to using these areas. All these opportunities should be evaluated by specialists, to ensure meeting LSR objectives listed in the ROD and the Medford and Roseburg RMPs as well as the Umpqua National Forest Plan.
- 3. Areas greater than 10 acres which have been disturbed by wind, fire, insect or disease, and that have canopy closures below 40 percent as a direct result of the disturbance, may be considered for salvage. Any proposed salvage after such a disturbance would be evaluated on a site-specific basis by an interdisciplinary team. The overall goal would be to conduct salvage operations, consistent with standards and guidelines in the ROD and the appropriate RMP or Forest Plan, as well as being consistent with LSR objectives. All green trees, likely to survive, would be retained. The number of snags and down logs retained would vary based on vegetation zone, site conditions, potential for re-burns, and other factors, but the numbers would always be at the upper levels for snags and coarse woody material.

Some options for salvage in those situations include:

- a. No salvage consider the value to the site of not conducting salvage if such action aids in meeting LSR objectives. This evaluation could be based on the size of the disturbance, type of disturbance, location, etc.
- b. Partial salvage leave forest components (standing or down trees) in the disturbed area to meet LSR objectives. This may include leaving on site variable numbers of snags and down woody components that would emulate the conditions in late-successional forests. All standing live trees, including injured trees that are likely to survive the event would be retained. Other general salvage guidelines may be found in the ROD on pages C-13 to C-15.
- c. Other scenarios presented in the ROD should be used to guide actions not presented here.

Salvage or partial salvage, as described, is not exempted from REO review.

IX. Restoration Forestry

The following silviculture treatments will result in desired late-successional habitat conditions being attained earlier than if the action had not been taken.

A. Reforestation, Interplanting, and Maintenance

Lands altered by disturbance within the LSR may need reforestation to quickly reach late-successional conditions or to protect site quality. Depending on the severity of the disturbance, and to attain appropriate late-successional conditions, conifer and/or hardwoods may need to be planted or interplanted among existing trees. The treatment would provide for a variety of species appropriate to the site. Maintenance of the stand, through treatments such as, mulching, manual brush cutting, or animal damage control, may be necessary to ensure survival of the appropriate trees.

Benefits: Tree species will occupy the site quicker than if left to natural regeneration. A diverse species composition can be planted that is appropriate to the site and to meet late-successional objectives.

Stand Selection Criteria: Stands altered by disturbance, such as fire, blowdown, or previous harvest, may be selected for reforestation or interplanting treatments. Treatment would be beneficial to the development of late-successional conditions. Young stands where survival of desired species is being jeopardized by competing vegetation, animals, or other environmental conditions would be candidates for maintenance or protection treatments.

Desired Condition: Reforestation treatments, either through spacing, planting area designation, or expected survival or growth patterns, would result in substantially varied spacing in order to provide for some very large trees as quickly as possible, create areas of heavy canopy closure and encourage the growth of a variety of species appropriate to the site and the late-successional objectives.

Treatment Acres: Reforestation treatments would occur following stand replacement events and no estimate is made. Interplanting and maintenance would be conducted as needed to ensure successful reforestation.

Future treatments: Depending upon stocking levels, a release treatment or density management may be necessary.

B. Release

On some sites, there may be undesirable vegetation which delays the development of desirable stand components and attainment of late-successional objectives. A manual release of the stand may be necessary to ensure development of the appropriate vegetation.

Benefits: Release can accelerate the growth of selected trees by reducing the effects of competition. This will shorten the period of time needed for the creation of large diameter

trees, snags, and large down woody debris that are all key components of late-successional forests. The growth of desirable components of the stand would be ensured and would allow the site to be occupied by species appropriate to meet late-successional conditions.

Stand Selection Criteria: Stands that are being regenerated as a result of disturbance and where the growth and development of the regenerated species is being reduced by overtopping brush or hardwoods, may be selected for release treatments. Depending on the site, release may be done in conjunction with density management. All hardwoods and conifers over 8" dbh would remain untreated. Modeling of site conditions would indicate that development of late-successional conditions would be accelerated by treatment.

Desired Condition: Release treatments, either through spacing or species selection, would result in substantially varied spacing, provide for development of very large trees as quickly as possible, maintain areas of heavy canopy closure, and encourage the growth of a variety of species appropriate to the site and the late-successional objectives.

Treatment Acres: Release would be conducted as needed to ensure successful reforestation. No estimate is made of the number of acres.

Future treatments: Depending upon stocking levels, a density management may be necessary. Density management could also introduce other components necessary to attain late-successional habitat.

C. Density Management of Sapling Stands

The main goal is to reduce stocking and increase tree growth to keep the trees in a vigorous, healthy condition. Thinning could be done by cutting or girdling the trees. At this early age, keeping the trees healthy and vigorously growing will allow flexibility in regulating stand structure in future stand management. Snags are absent in these stands. Future creation of large snags and down wood depends on live trees that are now putting on good diameter growth. Not thinning would result in small diameter trees along with dead trees, as a result of suppression mortality, that are a smaller diameter than the live trees.

Benefits: 1) Density management can accelerate the growth of trees by reducing the effects of competition. This will shorten the period of time needed for the creation of large diameter trees, snags, and large down woody debris that are all key components of late-successional forests. In the long term, the proposed treatment will be beneficial to the creation and maintenance of late-successional forest conditions.

2) The species composition of the stand can be manipulated. The existing species composition of the stand depends on the vegetation zone of the stand, the composition of the previous stand before harvest or disturbance, and the type of disturbance. In most cases these are stands that were planted following clearcut logging. Treatment would provide for retention of hardwood species and conifers in a mix appropriate for the vegetative zone. Species preference to minor conifer species can maintain those species in the stand.

3) Both the riparian reserve and upland portions of the stand could be treated. Site specific prescriptions would provide for untreated buffer strips along streams to provide bank stability and shade. Thinning within the riparian reserve is consistent with the aquatic conservation strategy to control stocking and grow larger trees.

Stand selection criteria: Potential stands for this type of treatment are generally even-aged (less than 20 years old), single canopied stands in the open sapling seral stage with greater than 300 trees per acre. Most stands were created following previous regeneration harvests.

Density management could also be applied to the understory of modified older stands where it meets the previous criteria.

There are some stands that were planted with off-site pine. These stands will not develop the characteristic structure and composition of natural stands without some type of disturbance or treatment. The pines are of poor form, not thrifty, and subject to Bynum's blight. On better sites, local species have become established and become dominate. On poorer sites, the off-site pine retains or shares dominance. In these stands, the pine would be selected as leave trees only if no other suitable trees were available.

Desired condition: Resultant trees per acre following the thinning would be approximately 170-220 trees per acre. The species mix would be similar to that of late-successional and old-growth forests within that vegetative zone for both hardwoods and conifers. Depending on the site specific characteristics, all hardwoods could be retained, or thinned around, to maintain these species in the stand. Selected sprouting hardwood species, such as madrone or big leaf maple, could be thinned back to one dominant stem. No trees over 8" dbh would be cut, to maintain the largest trees and any residuals. Spacing of the leave trees would be variable but the overall trees per acre would fall within the previous estimate. Areas of unthinned trees and stream buffers would be maintained for spatial diversity. Also see the fire management and risk reduction sections for possible fine fuel treatments.

Treatment Acres: A maximum of 7,000 acres is estimated to be treated within the next 10 years. This is about 10% of the federal land in the LSR or 1% per year. Acres in the 20 to 40 year age classes would generally not be treated.

Future treatments: Stands treated when in the open sapling seral stage are too young to accomplish many of the attributes of late-successional forests. The main goal is to keep the trees healthy and vigorously growing in diameter and crown ratio. Density management can influence certain aspects that will last the life of the stand. Tree culturing could be done with this treatment. The species composition of the overstory of the stand can be influenced. A moderate to high degree of canopy closure can also be maintained. At least one other treatment would be necessary to put the stand on a path to attain other characteristics of the late-successional forests, such as multiple canopies or understory initiation and large down wood or snags. Also it is too early in stand development to select for trees with defects, such as broken tops, cavities, or large limbs. Trees of this age are growing fast enough that openings close in quickly. To create openings and plant an understory cohort at this age with

a difference in ages of only 10-15 years would not attain the objectives. Another treatment could be necessary in 30-40 years following the density management to introduce other characteristics.

D. Density Management of Mid-seral Stands (40-80 Years Old)

This proposed treatment would accelerate the development of the stand into a multilayered stand with large trees, canopy gaps for spatial diversity and understory development, snags, and down wood. Treatments would take advantage of opportunities to optimize habitat for late-successional forest related species in the short term.

Benefits: 1) Structural diversity is enhanced. The resultant stand will contain a variety of stand densities for development into late-successional conditions. The growth of leave trees at lower densities will accelerate due to the reduction of competition. This will shorten the period of time needed for the creation of large diameter trees. Unthinned areas will maintain the suppression mortality that is likely occurring in these stands and provide visual cover. Snag and down wood recruitment will continue in those areas. In the thinned areas, snags and down wood could be added within 5 years to meet requirements. Wide spacing of leave trees and canopy gaps will encourage understory vegetation development for both horizontal and vertical structural diversity. In the long term, the proposed treatment will be beneficial to the creation and maintenance of late-successional forest conditions.

2) Species diversity is enhanced. Treatment would provide for retention of hardwood species and conifers in a mix appropriate for the vegetative zone. Hardwoods are a key component in much of the LSR and in a single story conifer stand hardwoods are normally overtopped and drop out of the stand. Often, hardwoods can be only be maintained in the stand by treatment. Species preference to minor conifer species can maintain those species in the stand. Wide spacing and openings will encourage the initiation of structural diversity and understory development.

Stand selection criteria: Potential stands for this type of treatment are generally even-aged, single canopied, overstocked stands dominated by a single species. The focus would be on stands that have been regenerated following timber harvest or have been thinned or unmanaged natural stands that meet this criteria. There may be low numbers of residual larger trees or snags within the stand. Canopies are closed with very little ground vegetation. Within stand diversity is generally low. Snags have primarily been caused by suppression mortality and are generally less than 12" dbh. Down wood is also a result of this mortality and is also of a small size. Stands in the older age classes may have some understory initiation of tolerant tree species taking place.

There may also be some of the older off-site ponderosa pine stands in this mid-seral stage. These stands will not develop the characteristic structure and composition of natural stands without some type of disturbance or treatment. See more of a description under the density management of open sapling stands above.

Stands selected in the connectivity corridor of the northern portion of the LSR must allow for maintaining connectivity at the stand level. This means the treatment design would be varied enough (maintaining untreated areas) to allow this function to continue at the stand level. Stand selection would also consider private actions in the checkerboard portion of the LSR. A density management would not be proposed adjacent to a private regeneration cut.

There may also be stands in the mid-seral stage that would not benefit from density management. Stands that started out at lower densities may be developing adequately and are beginning to become valuable to late-successional species. These stands are multi-level and contain hardwoods that will be maintained in the stands.

Desired condition: The resultant stand would contain a variety of trees per acre following the density management. At least ten percent of the stand would remain in unthinned patches to retain processes and conditions such as thermal and visual cover, natural suppression and mortality, small trees, natural size differentiation, and undisturbed debris. Three to 10 percent of the stand would be in heavily thinned patches of less than 50 trees per acre or in openings up to 1/4 acre in size to maximize individual tree development and initiate structural diversity. Selection of leave trees would not be based on leaving the healthiest, best formed trees. A percentage of the leave trees would be in culls or broken top green trees. The trees removed would generally be in the intermediate and suppressed crown classes, though a range of diameters of the leave trees would be favorable. A species mix similar to that of latesuccessional forests within that vegetative zone would be maintained for both hardwoods and conifers. Douglas-fir would be the dominant overstory species in all the zones. No trees greater than 20" dbh would be cut, except for the purposes stated in the REO exemption criteria (see Appendix). All remnant snags would be retained where they do not present a safety problem. Areas of unthinned trees around the snags would facilitate their retention and lessen the safety concern. Spacing of the leave trees would be variable. Depending on the individual stand characteristics, green trees may need to be felled and left on the ground to accomplish the down wood objective.

Treatment of areas designated as riparian reserves would vary depending on the stand and the presence of large conifers next to the stream. Treatment would generally fall into two categories: 1) the entire width of the riparian reserve could be left untreated, or 2) an untreated buffer less than the riparian reserve width could be left next to the stream with various levels of thinning treatment on the adjacent portion. The buffer width at a minimum would meet the aquatic conservation strategy objectives. The thinned portion would provide the benefits of large trees and down wood to the system and could have different objectives and design than the upland portion.

In the connectivity corridor of the northern portion of the LSR, connectivity would be maintained at the stand level. In other areas, when connectivity is not maintained at the stand level, a site specific analysis should indicate that connectivity habitat is not limiting in the surrounding area, and will not be limited following treatment. The quality, quantity, and spatial arrangement of the connectivity habitat would be considered.

Treatment Acres: A maximum of 2,000 acres is estimated to be treated within the next ten years. This is about 3% of the federal land in the LSR or 0.3% per year. Possible locations shown on Map 8 coincide with the age classes for dispersal habitat.

Future treatments: A density management treatment tends to reduce the rates of suppression mortality. This is a beneficial silvicultural effect for attaining large diameter trees, but it reduces snag recruitment. It will however provide for larger snag sizes at an earlier age in the stand development. Artificial creation of snags may be possible in the short term. Within five years following density management, snags or CWM would be provided to reach the desired levels per acre in the post treatment stand. (See also the Coarse Woody Material and Snag Criteria for Managed Stands section.) To ensure understory development, the stand could be underplanted with an appropriate species such as hemlock or white fir, though natural regeneration would occur.

Examples: In the Roseburg District, a density management is proposed in the Beals Creek area in T30S, R4W, Sec 27. This is a 40 year old stand that is losing some of the species diversity due to the stand going into a stem exclusion stage and becoming dominated by even aged Douglas-fir. Desirable understory species and hardwoods are being shaded out. There are over 500 acres in this even age type, of which less than 100 acres would actually be treated through thinning or creation of small openings. This area was noted in the landscape level criteria for treatment and even though the stand falls just outside the connectivity corridor, treatment design will allow for maintenance of connectivity at the stand level.

The Forest Service is proposing a density management of 11 acres in T32S, R2W, Sec 8 in an area called Wildcat. This is an even aged, single cohort, overstocked stand at the southern end of the LSR. This is also designed to hasten the stand towards late-successional characteristics, increase species diversity, and improve vigor of the stand, including sugar pine culturing.

E. Density Management of Stands Greater than 80 Years Old

There are a limited number of stands in the LSR older than 80 years of age that have similar stand conditions to those described above for the mid-seral stands (single canopied, low within stand diversity) and should be considered potential treatment units. The lack of functionality of these stands for late-successional related species is more important than age of the stand. The stands may function as dispersal habitat but not nesting habitat due to the lack of structure. Stands would continue in this condition for a long period with the lack of disturbance.

There are also older stands that due to the exclusion of fire have developed differently than natural stands would have when fire was still a part of the ecosystem. A white fir understory has developed in these stands due to the absence of fire. These stands would benefit from density management. Such a prescription would be supported by empirical information or modeling for the specific site that would indicate that achievement of late-successional conditions would be accelerated.

Treatment of these stands would be subject to REO approval.

Older stands which currently exhibit late-successional or old-growth characteristics should be retained without active management, unless they are identified as needing treatment as part of a risk reduction effort.

F. Pruning

There may be stands within the LSR that would benefit from pruning. In young stands of sugar pine and western white pine, pruning could be done to reduce the risk of infection with white pine blister rust. Pruning could also be used to reduce fuel ladders along with hand piling of the slash to reduce fuel loading in high fire risk stands. Adjacent stands of different heights could be pruned to provide flyways between the stands.

For White Pine Blister Rust:

Some young stands planted following harvest have been planted with a variety of species including sugar pine and western white pine. These two species are susceptible to white pine blister rust. This disease girdles and kills branches, tops, and stems. The disease, by itself, will generally not kill large trees, but it causes considerable mortality in young saplings and poles.

Planting seedlings that have been screened for disease resistance is the preferred method of dealing with this disease. Some of the already established stands within the LSR may have been planted with stock that was not tested for disease resistance. In young plantations the risk of mortality can be reduced by pruning trees to a height of 10 feet. Moist, cool or foggy weather in the summer and fall favors spread of the disease. The spores are very short lived in warm dry weather. Knowledge of local weather and fog patterns aid in stand selection. Pruning and thinning alter the microclimate, making it less favorable for the pathogen by fostering drier conditions. Pruning also eliminates many of the most favorable infection sites, which are the lower branches and needles of the pines. To retain sugar pine and western white pine as a component of future stands in the LSR, pruning needs to be maintained as a management option.

Benefits: Species diversity is enhanced. The pruning of sugar pine and western white pine can reduce the risk of infection and possible death to young saplings and poles. Those species are more likely to be maintained in young stands.

Stand selection criteria: Planted stands, generally in the 10-20 year age classes, that have a proportion of sugar pine or western white pine planted in them would be candidates for pruning. Stands with a higher proportion of those species would be given higher priority. Stands with full crowns that have a closed canopy or a canopy that is beginning to close would be given priority over more open stands. Trees that are twenty feet tall with full crowns would permit pruning to the recommended height of 10 feet and still maintain 50% of the tree in a live crown.

Desired condition: Pruning may be done in conjunction with density management to open the stand and allow for drying conditions to occur. The pruned tree would be maintained with enough live crown to maintain vigor. All white pines and sugar pines within the treated stand would be pruned. The risk of sugar pines and western white pines to infection by white pine blister rust would be minimized. These two species would remain a component of future stands.

Treatment Acres: Approximately 3,000 acres are estimated to be treated within the next ten years. However, sugar pine and western white pine were planted at fairly low densities in the stands, probably only 50-100 trees per acre. Some trees may have already been killed by the blister rust.. So there could be very few trees pruned over these acres. This is approximately 4% of the federal land in the LSR over the decade.

Future treatments: No other treatments for white pine blister rust would be necessary, although other silviculture actions to attain late-successional conditions could be done.

Pruning for other objectives:

- 1) Plantations in the LSR are generally very dense with full crowns that reach to the ground. After density management of open sapling stands, the crowns close back in very quickly, and form a dense closed full canopy from the ground up. Pruning, at some point in stand development, to a minimum of 16 feet would provide open fly ways through the stands for neotropical birds and could enhance connectivity between adjacent stands.
- 2) Young stands tend to keep a full crown, particularly following a density management treatment of an open sapling stand. These stands have a high susceptibility to crown fires, since the canopy reaches to the forest floor. Pruning would remove the lower branches. Concurrently treating the understory slash created by the pruning would reduce the probability of a ground fire crowning and eliminating an entire stand. Without pruning, a fuel ladder exists from the ground vegetation to the tree canopy.

G. Fertilization

The supply of soil nutrients would be conserved through design of management actions and could be augmented through fertilization. The goals of fertilization would be to provide the large tree component of late-successional forests quicker than would be accomplished without the treatment, to improve stand vigor, and to reduce the susceptibility to insects and disease. The application of fertilizer would be at 200 pounds of nitrogen per acre in the form of an aerially applied urea based prill for even distribution and to minimize drift..

Benefits: Fertilization increases the growth rate of individual trees so that they would reach a larger size in a shorter amount of time than if not treated. Fertilization results in accelerated tree growth for up to 8-10 years following treatment (Chappell, et al 1992). Increases in both diameter and height growth have been noted. Canopy closure is accelerated through crown expansion and densification.

Very little information is available on the effects of fertilization on understory components. The understory composition changes with stand history, age, and stocking. In young stands, fertilizer additions usually result in increased understory growth and hence increased competition. When the trees have outgrown the understory, increased shade effect may lead to larger understory plants with a higher nutrient content and a lower diversity.

Stand selection criteria: Managed young stands that have had a density management treatment within the last 5 years could be selected for treatment. Stands in moderate to low site classes (sites 3 and 4) would receive priority. Untreated buffer strips along all known streams and ponds would eliminate direct application to water. In nearly all routine fertilizer applications, peak concentrations of urea-N, ammonia-N, and nitrate-N in streams are less than 50% of the recommended limits for drinking water and the protection of salmonid fishes (Bisson, et al 1992). This would also be the case in this LSR with a very limited amount of fertilization proposed and the utilization of untreated buffer strips. These buffers would be a minimum of 100 feet along all intermittent and perennial streams and other bodies of water.

Treatment Acres: Approximately 2,500 acres are estimated to be treated within the next ten years. This is about 4% of the federal land in the LSR or 0.4% per year.

Future treatments: Young stands could receive a density management treatment in the future to introduce other components of late-successional habitat.

H. Tree Culturing

Tree culturing would have as an objective the maintenance or development of desired stand characteristics, principally larger "wolf-type" trees with large branches, or the maintenance of large old ponderosa pine or sugar pine trees within stands, or even the maintenance of hardwoods within the stands. As needed to meet stand structural objectives, individual trees or small groups of trees would be isolated from the remainder of the stand. Treatment would involve creation of small "holes" or openings in the stand with trees to be cultured situated in the openings. Tree culturing may also be done around selected "plus-trees," other trees involved in research, and trees that are infected with dwarf mistletoe.

Benefits: 1) Structural diversity is enhanced. Growth potential is concentrated into desired stems. The development of larger trees and the habitat they provide is enhanced. Cultured trees retain limbs longer as lower limbs are not as likely to be self-pruned because of shade from adjacent trees. Limbs also have the opportunity to get larger than in closed stands. With the creation of openings the development of multiple canopy layers is accelerated.

2) There are opportunities to enhance or maintain species diversity. Ponderosa and sugar pines, particularly large old trees, are declining due to a complex of factors including mountain pine beetle, overstocking, white pine blister rust, and drought. Exclusion of fire has allowed an understory to develop contributing to the overstocking and stress of the pines. Clearing around these trees or culturing can maintain these species in the stands. There are some areas where this could occur in stands older than 80 years. Such stands would require

REO review.

- 3) Tree culturing around selected "plus-trees" or other trees involved in research allows the development and retention of fuller canopies and enhances cone production. Culturing of these trees also isolates them from the remainder of the stand. With the installation of squirrel guards, cone predation can be reduced.
- 4) Culturing of mistletoe infected trees provides some control of the mistletoe and creates conditions (light, open ground) so that an understory of non-susceptible species can be established. Mistletoe is retained in the stand but not at levels that prevent LSR objectives from being achieved.

Treatment Selection Criteria: Potential trees to be cultured include larger residual mature and old-growth conifers and larger hardwoods that exist within a stand of younger sapling and pole size trees. In some cases it may be desirable to culture individual larger trees that exist within stands dominated by hardwoods or within stands that are a mix of hardwoods, shrubs, and regeneration. It is anticipated, however, that the majority of treatments will occur in stands that have closed or nearly closed canopies and in conjunction with density management. While structural diversity may be enhanced by culturing a variety of species, the majority of species to receive treatment will be those that are intermediate or less in shade tolerance. Douglas-fir and pines will be the principal species. Plus-trees to be cultured will be those that have been identified as having desired characteristics such as fast juvenile growth or frost hardiness or those trees that have been identified as important in gene conservation. Individual trees involved in research to be cultured would be those that are a part of REO reviewed research. Mistletoe infected trees to be treated would be those in heavily infected stands that because of the mistletoe are unlikely to develop into latesuccessional habitat or that are unlikely to provide meaningful late-successional habitat over the long-term.

Desired Condition: Large conifers and hardwoods would remain in LSR stands or would develop over time. Cultured trees would be more fully crowned than trees in the adjacent stand. Trees would have large branches that provide surfaces for nesting, roosting, and perching by late-successional animals such as the northern spotted owl. In some areas, trees with large branches near the ground would exist. In other areas the openings around cultured trees would provide canopy gaps where multiple canopy layers would form. Dwarf mistletoe would remain in stands where it currently is and would contribute to late-successional functions. Dwarf mistletoe would not prevent late-successional habitat from developing and staying on the landscape for extended time.

Treatment Acres: Approximately 2,000 acres are estimated to be treated within the next ten years mainly in conjunction with density management. This is approximately 3% of the federal land in the LSR over the decade. Very few trees, possibly only one or two per acre, would actually be treated.

Future Treatments: Culturing could be done in conjunction with density management.

Additional and future treatments under cultured trees may be necessary. If the objective is to develop multiple canopy levels, underplanting may be desirable. In some cases follow-up protection and maintenance treatments may also be desirable. Culturing treatments designed to increase the vigor and resiliency of selected trees and plus-trees that have been treated may require follow-up treatments that reduce natural seedlings and resprouting shrubs/hardwoods. Follow-up treatments to reduce natural seedlings and resprouting shrubs/hardwoods may also be needed when retention of branches near the ground is desired. Underplanting with nonsusceptible species followed by periodic roguing of infected naturals may be necessary to establish another canopy layer under a tree infected with dwarf mistletoe (ex. ponderosa pine under an infected Douglas-fir).

X. Other Nonsilvicultural Activities

Nonsilvicultural activities located inside Late-Successional Reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat are allowed. Most of the following activities are expected to have neutral or beneficial effects on late-successional habitat. Multiple-use activities other than silvicultural activities that may have potentially adverse impacts to the creation and maintenance of late-successional habitat must be reviewed by the Regional Ecosystem Office if adjustments in standards and guidelines are going to be made (ROD p. C-16). Some of the following activities may need adjustments in the standards and guidelines in order to occur within the LSR. Other nonsilvicultural activities that may arise in the future should be analyzed following the standards and guidelines in the ROD.

A. Habitat Improvement Projects

The ROD states that habitat improvement projects designed to improve fish, wildlife or watershed conditions should be considered if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible. Projects required for recovery of threatened or endangered species should be considered even if they result in some reduction of habitat quality for other late-successional species. Habitat improvement projects for fisheries would have a neutral or negligible effect on late-successional species. Projects could include such things as restoration of conifers in the riparian reserves or placement of instream habitat structures. Restoration of conifers to the riparian reserves could be implemented along with silvicultural treatments in the uplands, though the treatment objectives and design may differ.

Part of the LSR is in a Tier 1 Key Watershed. Key Watersheds should be given the highest priority for watershed restoration. Stouts Creek Watershed, within the upper South Umpqua River Tier 1 Key Watershed, has potential opportunities for habitat improvement projects due to the Bland Mountain Fire. These projects would be designed and implemented in a manner consistent with Late-Successional Reserve objectives. More detail would be available at the project level.

Past land management activities (clearcutting and road construction) and the Bland Mountain Fire have reduced riparian vegetation adjacent to streams in the Stouts Creek Watershed. An Aquatic Habitat Inventory of the Stouts Creek Watershed conducted by ODF&W identified limiting factors as low numbers and volume of large woody debris, sediment in streams, and the lack of pools greater than three feet in depth. Also, roads constructed within riparian areas limit future recruitment of large woody debris into the streams.

A stream restoration project has been planned on the mainstern of Stouts Creek located in T. 31 S., R. 3 W., Section 3. The proposed project site, approximately 0.4 mile of Stouts Creek, was determined to be deficient of several desirable instream habitat features (i.e., CWM and pools). The Stouts Creek Fisheries Habitat Enhancement Project includes plans for providing large woody debris structures to the stream channel, placement of boulder-rootwad

clusters, construction of blast pools and alcoves, and placement of shade logs across the stream channel. These structures are intended to provide a variety of habitats for the fish species and other aquatic organisms within Stouts Creek. The materials (i.e., logs and boulders) have been delivered to the project site, so disturbance of existing vegetation would be minimal. The 31-3-34.0 road located adjacent to the mainstem of Stouts Creek provides access for heavy mechanized equipment to the project site. The Stouts Creek Fisheries Habitat Enhancement Project was developed prior to but has been on hold since the signing of the Record of Decision.

B. Recreation/Developments

The Upper Cow Creek Recreation Area lies within the LSR. The Upper Cow Creek WA includes a complete list of existing and proposed recreation facilities within the Upper Cow Creek Recreation Area.

Lands within the Roseburg District BLM portion of the LSR are managed generally for dispersed recreation. Recreation potential identified by the South River Field Office is included in the Stouts/Poole/Shively-O'Shea Creeks WA. The proposed Bear Gulch Research Natural Area (RNA) is within the LSR. However, recreation use within this RNA is discouraged at this time.

Several existing trails occur within the LSR. Maintenance of the existing trails, such as the felling of hazard trees, is allowed within the LSR (ROD). Other trails are proposed to be constructed in the future. Two examples within the Roseburg BLM are trails along Stouts Creek and from the end of the 31-3-10.3 road along the ridge top to Green Butte. These trails may require the cutting of vegetation within late-successional forests but would not adversely affect late-successional habitat because of the relatively small amount of vegetation cut. Generally, the proposed trails would be consistent with the overall semi-primitive nature of the area and LSR objectives.

Galesville Reservoir Campground Development

At present, there are no developed facilities for camping near Galesville reservoir. There are no known plans for development of any private camping areas in the vicinity. In addition, areas along the county road adjacent to the reservoir are closed to overnight camping due to safety and environmental hazards. As a result, visitors to the reservoir who wish to camp nearby often travel 15 miles upstream to the USFS campground at Devils Flat. The Devils Flat Campground is not designed to accommodate the amount or type (lake related) use it is currently receiving. Other visitors do not make the drive to Devils Flat. They camp on side roads near the reservoir, both public or private, resulting in wide spread impacts of untreated human waste, litter, increased fire hazard and risk, and other impacts associated with frequent use of these sites. Many sites near the lake are occupied almost every weekend. Current management allows visitors to stay on BLM land for up to 14 days. A developed campsite would provide a better opportunity to monitor and control use. Many of the affects of dispersed use would be concentrated and could be managed and mitigated.

Proposals call for the construction of an 11 to 15 site campground, approximately sixteen acres in size, adjacent to Galesville Reservoir in T. 31 S., R. 4 W., Sec. 27. The campsite would be adjacent to the existing Douglas County, Chief Miwaleta Day Use Area. It would be situated in a stand that is currently not functioning as late-successional habitat that lies between the Upper Cow Creek Road and the reservoir. Campsites would include basic facilities of a parking spur, picnic table, fire ring, and tent area and would have electric hookup available. One site would be designed to have a full hook-up (water and sewer) for a campground host. A restroom and shower facility would be centrally located within the campground and would connect to water and waste treatment facilities that currently exist at the adjacent day use area.

The proposals were developed under a Memorandum of Understanding with Douglas County Park Department; Oregon Department of Fish and Wildlife; and the U.S. Forest Service, Tiller Ranger District, in cooperation with several landowner representatives from the surrounding area. Douglas County has expressed interest in either acquiring the site or constructing and managing the site under an R&PP lease. The first choice of Douglas County is to acquire the site. Douglas County is currently pursuing alternatives to allow this to occur.

Several areas were analyzed to determine the best location for a campground. Criteria for site selection included proximity to the reservoir and existing facilities, ownership, slope, relative absence of water features such as springs, size and stability of vegetation on site and size of suitable area. Several sites were considered including one on private property. The current site, though small in size, rated as the best location among those available, or potentially available, in the area for this use.

C. Research

The four progeny test sites of the tree improvement program within the LSR are considered existing research developments and will continue to be managed for their original purpose of genetic testing for growth and yield. The sites are part of the Northwest Tree Improvement Cooperative (NWTIC) that coordinates all the test sites. The experimental approach was developed as a region wide standard in 1966 for this study. These sites exist on other land use allocations as well as private ownerships throughout the region.

Management of the progeny test sites in the short term are in some ways inconsistent with the objectives of the LSR. Progeny test sites will be managed similarly regardless of the land use allocation where they are located. Each cooperative unit has a schedule for data collection and analysis which is typically at 5, 10, 15, and 20 years of age. As the sites finish their measurement sequences, they may be thinned in a manner to preserve selected genetic individuals. These future thinnings will not be to attain old-growth or late-successional characteristics but for retention of selected individual trees identified as the highest ranking trees for growth and yield. The pattern of thinning in the test sites will be systematic or nearly so to selectively maintain the desired trees. Resulting information will be useful for addressing genetics questions in the implementation of the Forest Plan. Test site thinning proposals are peer reviewed by the NWTIC. Sites are expected to be maintained for a 40

year period. Treatments at the conclusion of the study would be planned according to the land use objectives of the site. Even though the test sites will not be managed for old-growth characteristics or LSR objectives in the short term, the results of the research will be to grow larger trees more quickly. Based on the number of trees to be cut and the small area within the progeny sites, the risk to the LSR should be minimal.

To protect and maintain the vigor of the parent "plus trees", especially the parents of the highest ranked trees in the progeny test sites, removing the competing vegetation around the trees may need to be accomplished. This could involve removing, topping, or girdling trees adjacent to the "plus trees". Potential treatments of individual "plus trees" for cone stimulation and insect control could include fertilization or metasystox injections.

Any new research activities should be consistent with Late-Successional Reserve objectives. New research activities which are potentially inconsistent with LSR objectives should only be considered if there are no equivalent opportunities outside of the LSR and would be subject to review by the REO.

D. Special Forest Products

Special forest products collected in the LSR include vegetative materials such as beargrass, salal, other forest greens, evergreen tree boughs, Christmas trees, burls, berries, mosses, ferns, edible mushrooms, and firewood (fuelwood). The management and/or sale of special forest products may occur when such an activity is neutral or beneficial to meeting LSR objectives and neutral or beneficial to the species itself.

Throughout the LSR, harvest will be done to insure viability of the species. As an example, the South River Field Office has been divided into three areas for beargrass collecting to ensure sustainability of the resource. Only one area will be open for beargrass permits at any one time to allow the other areas two years to recover before allowing people to collect beargrass again.

Firewood cutting would be conducted to a lesser extent than beargrass picking. Firewood should be cut only in existing cull decks or in recent treatment units where down material would pose an unacceptable risk of future large scale disturbance.

Bough collecting would be allowed to occur on a limited scale, mainly near existing roads. Bough cutting would not alter the upper two-thirds of a tree and would not be permitted on trees shorter than fifteen (15) feet. Any whole trees available for bough collection would be those felled as part of a silvicultural or risk reduction activity.

E. Roads

Management objectives for individual roads require detailed information that is beyond the scope of this assessment. More information is contained in the watershed analyses. As watershed analyses are updated, transportation management objectives would also be updated.

This process balances land management access needs as well as access to adjacent private lands, with the need to reduce the amount of roads to meet the ACS and LSR objectives.

Routine road maintenance, roadside brushing, and repair of storm damage to roads, culverts and facilities would be accomplished incorporating best management practices (BMPs) into the project design to provide safe access routes, reduce hazards to humans along roads, or to meet other objectives. Road maintenance could include the felling of hazard trees or roadside trees to maintain sight distance. Leaving material on site should be considered.

Access to non-Federal lands, existing right-of-way agreements, contracted rights, easements and temporary use permits in the Late-Successional Reserve are recognized as valid uses.

New road construction is generally not recommended unless potential benefits outweigh the impacts. New road construction should be designed and located to avoid late-successional habitat if possible and minimize adverse impacts. Where possible, new road construction should be limited to temporary roads which can be rehabilitated following use.

Closing roads to public motor vehicle use or road decommissioning would serve many functions, including reducing disturbance and harassment to wildlife, reducing erosion into streams, reducing loss of snags and down logs to illegal firewood cutting, reducing potential for accidental fire ignition, and others. Generally these closures would contribute to meeting LSR objectives.

As mentioned earlier in this document, the upper South Umpqua River has been designated as a Tier 1 Key Watershed. Part of the strategy within Key Watersheds is to reduce the amount of existing roads through decommissioning. If funding is insufficient to implement reduction, there will be no net increase in the amount of roads in Key Watersheds. Within the Roseburg BLM Stouts-Poole-Shively-O'Shea Watershed Analysis, Transportation Management Objectives identified approximately four miles of natural surface roads under BLM control for possible decommissioning. Approximately three miles of road in the Glendale RA portion of the LSR are currently in plans to be decommissioned.

Operations within existing rock quarries would be continued. Impacts from using existing quarries are not considered to have a negative effect on the overall integrity of the LSR and would have much less effect on LSR objectives than new developments. The potential benefits of upgrading roads with rock from existing quarries and helping to attain Aquatic Conservation Strategy objectives exceed the negative effects. Any expansion of existing quarries in the future is not expected to inhibit attainment of LSR objectives. There would be no expansion of quarries into riparian reserve areas. Appendix E lists the status of quarries on the Medford District and Umpqua National Forest.

There are also three identified locations which have the potential for quarry development. Development of these new quarries may involve some loss of late-successional habitat, generally in patches of 2-3 acres and along existing roads. Future development of new quarries would be evaluated to weigh the benefits of extracting the rock against the loss of

late-successional habitat and other adverse effects. Any quarry development activities would be subject to REO review and approval.

F. Nonnative species

Standards and Guidelines in the ROD state that nonnative species should not be introduced into LSRs. If introduction of a nonnative species is proposed, an assessment of impacts should be completed and any introduction should not retard or prevent achieving LSR objectives. The introduction of nonnative plant species has often been through management activities such as road construction, stockpiling of rock, seeding of grasses and legumes, and other activities that create disturbances. Stabilizing road banks by mulching or seeding with grasses may inadvertently introduce nonnative species into the LSR. However, this should not retard or prevent achieving LSR objectives.

The BLM and the Oregon Department of Agriculture (ODA) have an agreement where the BLM identifies and monitors noxious weed locations and the ODA implements the control measures. Controlling or reducing the extent of noxious weeds, such as star thistle, would generally benefit LSR habitat as long as undesirable side effects do not degrade habitat conditions. A preliminary inventory and mapping of noxious weed locations has been done within the Glendale RA portion of the LSR.

G. Tailholds and Yarding Corridors

As a result of the scattered BLM ownership pattern, occasionally adjacent land owners request permission, or federal land managers propose, to cut individual guy line trees, tailhold trees, or yarding corridors to facilitate harvesting on their own lands. In most cases, the requests are to gain the necessary deflection to provide one-end or full-log suspension or permit 'flying' logs over streams, to reduce or eliminate additional road construction, to reduce erosion, or to meet State safety requirements. Typically the yarding corridor requests are for corridors less than 30 feet in width spaced at intervals of about 200 feet with a length of less than 1,000 feet, or involve small wedge shaped areas less than an acre in size. Although these requests would result in cutting trees within a LSR, the resulting impact on the adjacent non LSR land would be reduced. Trees felled for guy lines, tailholds, or yarding corridors would be left on site.

XI. Fire Management Plan

The primary objective of fire and fuels management in the LSR is to minimize loss of late-successional habitat and functions within the LSR to high intensity, stand replacing fires. This would be accomplished through wildfire suppression and by the risk reduction activities noted earlier. Even with these efforts, wildfires may occur and will be managed according to the following guidelines.

Wildfire Strategies

All wildfires within the BLM portion of the LSR would be suppressed. Wildfires on the FS blocked ownership may be allowed to burn under prescribed conditions, though no plans are in place at the present time. (See the section on Prescribed Natural Fire). Suppression methods should seek to minimize adverse effects to late-successional habitat and function to keep fires to the smallest possible size.

The responsible Line Officer will designate a resource advisor familiar with the area to assist and advise the fire incident team. During fire suppression activities, fire managers will consult with the resource advisor and other resource specialists and work to minimize habitat damage (refer to standards and guidelines for the LSR). Priority for suppression activities will generally be preservation/protection of the major east-west connectivity corridor and quality late-successional habitat especially that surrounding known northern spotted owl nest sites or other areas where key species are known to exist.

Suppression tactics should consider public and firefighting personnel safety.

Suppression Techniques to Minimize Habitat Damage

- 1. Use of existing roads and natural fuel breaks for control lines.
- Location of base camps, spike camps, staging areas, and helispots outside of riparian
 areas and outside of known locations of threatened and endangered species. Use of
 existing campsites whenever possible.
- 3. Avoiding the use of heavy equipment in stream channels. Minimizing equipment use within riparian areas.
- 4. Construction of new control lines outside of riparian areas
- 5. Use of burning-out as a fire suppression tool.
- 6. Minimizing the building of new roads or widening of existing roads. Construction of fire lines only wide and deep enough to check fire spread.
- 7. Avoiding the application of retardant, foam, or other additives to open water and whenever possible to spotted owl nest sites.
- 8. Locating and managing water drafting sites to minimize adverse effects on riparian habitat and water quality.
- 9. Including construction of water bars as standard procedures on all roads and fire lines constructed by fire fighting equipment and personnel. Suppression efforts should be designed whenever possible to minimize erosion and sedimentation into streams.

10. Rapidly extinguishing smoldering coarse woody material, snags, and duff.

Fire Rehabilitation

There should be a post-fire evaluation to determine whether LSR objectives were adequately met during suppression activities and to identify necessary changes in management direction. After the evaluation is completed, a fire rehabilitation plan should be developed through an interdisciplinary process. Generally, treatments would be designed and implemented to minimize erosion and sedimentation into streams and to establish conifer dominated forests as quickly as possible on suitable sites. Rehabilitation treatments should be prescribed based on LSR habitat objectives, LSR diversity objectives, on-site values, probability of successful implementation, social and environmental considerations (including protection of native plant communities), and costs as compared to benefits.

Prescribed Natural Fire

Prescribed Natural Fire (PNF) is under certain circumstances a valid way of reintroducing or maintaining the effects of fire in an ecosystem. Under a policy of PNF, fires that were not intentionally set (such as a fire caused by lightning) would be allowed to burn given "prescribed" weather, fuel moistures, and other conditions specific to the site.

General management strategy: Prescribed natural fire is not currently an option for BLM managed lands. There is unacceptable risk of damage to resources on private land holdings and homes within portions of the LSR where ownership is not "blocked." Fire protection contracts that the BLM have preclude PNF as a management tool. As contracts are renegotiated, the subject of prescribed natural fire will be revisited, especially as it pertains to "blocked" federal ownership.

PNF is an option for lands managed by the Forest Service, but PNF is not exempted from REO review. At this time, there have been no specific projects identified within the LSR where PNF is the only option. Management ignited prescribed fire will still be considered where appropriate for meeting LSR objectives.

XII. Monitoring and Evaluation Plan

Monitoring is an essential part of natural resource management to provide information on the relative success of management strategies. Monitoring should be conducted at multiple levels and scales. Monitoring should occur at the project level and at a broader scale throughout the LSR. Monitoring should be conducted in a manner that allows localized information to be compiled and considered in a broader regional context. Future monitoring requirements driven by Regional concerns may be added later.

The ROD has identified key items to monitor in LSRs. These items are:

- Timber harvest consistent with standard and guidelines and with Regional Ecosystem Office review requirements.
- · Other management in the LSR consistent with the standards and guidelines
- · LSR assessment completed
- · Management activities consistent with the LSR assessment

The BLM Resource Management Plans and the Umpqua National Forest Land and Resource Management Plan have incorporated or amended to include all monitoring requirements and guidance contained in the ROD. These Plans may include other monitoring requirements relating to LSRs that are specific to the administrative units.

Three types of monitoring (implementation, effectiveness, and validation) described in the ROD should be integrated in monitoring projects and/or activities within this LSR. Implementation, effectiveness, and validation monitoring encompass the multiple levels of monitoring. The goal of implementation monitoring is to determine if the plan is being implemented correctly. Effectiveness monitoring should determine if the objectives of the plan are being achieved. Validation monitoring is to determine if the objectives are being met for the right reasons (based on the right assumptions).

Implementation monitoring for the BLM should answer two primary questions pertaining to Late-Successional Reserves from the Medford and Roseburg RMPs. A third item to monitor is included in the Medford RMP.

- 1. What activities were conducted or authorized within the LSR and how were they compatible with objectives of the LSR plan? Were activities consistent with ROD S&Gs, the LSR Assessment, and/or Medford RMP management direction, Roseburg RMP management direction, Umpqua National Forest Plan S&Gs and REO review requirements?
- 2. What is the status of development and implementation of plans to eliminate or control non-native species which adversely impact late-successional objectives?
- 3. What land acquisitions occurred, or are under way to improve the area, distribution, and quality of Late-Successional Reserves?

Additional questions for the Roseburg District to address, due to the Tier 1 Key Watershed

designation of the upper South Umpqua River would be those concerned with fish habitat. These items would include:

- 1. Are at-risk fish species and stocks being identified?
- 2. Are fish habitat restoration and enhancement activities being designed and implemented which contribute to attainment of Aquatic Conservation Strategy objectives?
- 3. Are potential adverse impacts to fish habitat and fish stocks being identified?

Effectiveness monitoring should determine how successfully projects or activities have achieved the objectives, goals, and/or desired future conditions in the LSR. Some key items to consider may include:

- 1. Is a functional, interacting, late-successional ecosystem maintained where adequate, and restored where inadequate?
- 2. Did silvicultural treatments benefit the creation and maintenance of late-successional conditions?
- 3. What is the relationship between levels of management intervention and the health and maintenance of late-successional and old-growth ecosystems?
- 4. Are desired habitat conditions for the northern spotted owl and for other latesuccessional forest associated species maintained where adequate and restored where inadequate?
- 5. Are desired habitat conditions for listed, sensitive, and at-risk fish populations maintained where adequate or restored where inadequate?
- 6. Are landscape level recommendations being met?
- 7. Is the health of Riparian Reserves improving?
- 8. Are management actions designed to rehabilitate riparian reserves effective?

Indicators for assessing these conditions and trends include:

- · land use data
- · seral development across the LSR
- · locations and concentrations of disease and insect infestations
- · fuel amounts by category
- · riparian and stream habitat condition by stream class
- · water quality

· retention of snags and down woody debris

Validation monitoring assesses the accuracy of underlying management assumptions. Most validation and some effectiveness monitoring would be conducted through formal research. Existing research projects may be integrated to answer the validation monitoring question.

New information gained through research, other watershed assessments, or outside sources should be evaluated to determine whether changes or adjustments to recommendations should be made to this LSR assessment, including the monitoring plan. In addition, the Medford and Roseburg BLM RMPs are scheduled to be formally evaluated at the end of every third year after implementation of the RMPs begins, until the preparations of new plans that would supersede the RMPs begins. The formal evaluation of the RMPs is to determine whether there is significant cause for an amendment or revision of the plans. This evaluation and/or revisions to the plans may affect this LSR assessment, causing the need to revise this assessment. The LSR assessment may also need to be revised at other times when it has been determined that additional information is needed or that a change needs to be made concerning existing information.

Because this LSR crosses BLM district boundaries and involves two federal agencies, a periodic review should be conducted to evaluate management activities and future plans. This review should involve all three parties.

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XIV. Appendices

- A. Special Status Species
- B. Late-Successional Species
- C. Common and Scientific Names
- D. Evaluation Criteria for Treatment Priorities Near Known Spotted Owl Nest Sites
- E. Quarries
- F. REO Exemption Criteria for Specific Silvicultural Activities

Appendix A - Special Status Species

SPECIAL STATUS SPECIES SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223)						
SPECIES (common name)	STATUS	PRESENCE	MONITORING LEVEL			
BIRDS						
Peregrine falcon	FE,ST	U	1			
Bald eagle	FT,ST	S	1			
Northern spotted owl	FT,ST	D	4			
Flammulated owl	SC, AS	U	1			
Great gray owl	S&M,SV,AS	Ū	1			
Pygmy owl	SU	S	1			
Northern saw-whet Owl	AS	S	1			
Northern goshawk	FC,SC, AS	S	1			
Mountain quail	FC3	· D	1			
Black-backed woodpecker	SC, AS	U	1			
Three-toed woodpecker	SC, AS	Ŭ	1			
Pileated woodpecker	SC, AS	S	1			
Lewis' woodpecker	SC, AS	U	1			
Acorn Woodpecker	SU	U	1			
Purple martin	SC, AS	U	1			
White pelican	SV	U	1			
Western bluebird	SV, AS	U	1			
Pygmy nuthatch	SV	U	1			
AMPHIBIANS/REPTILES						
Sharptail snake	SV,AS	U	1			
California Mountain kingsnake	SP, AS	U	1			
Common kingsnake	SP, AS	U	1			
Western pond turtle	FC,SC	S	1			
Del Norte salamander	S&M,FC,SV	U	1			
Clouded salamander	SC, AS	U	1			
Torrent salamander	FC,SV	D	1 .			

SPECIAL STATUS SPECIES SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223)						
SPECIES (common name)	STATUS	PRESENCE	MONITORING LEVEL			
Mountain yellow-legged frog	FC,SU	U	1			
Red-legged frog	FC,SU	U	1			
Tailed frog	FC,SV,AS	υ	1			
MAMMALS						
Townsend's big-eared bat	FC,SC	S	1			
Yuma myotis	FC	S	1			
Fringed myotis	FC,BS,SV,S&M	S	1			
Pacific pallid bat	S&M,SC,AS	S	1			
Silver haired bat	S&M	S	1			
Long-eared myotis	S&M	S	1			
Long-legged myotis	S&M S		1			
White-footed vole	FC,SP	S	1			
Red tree vole	S&M D		1			
Fisher	FC,SC, AS U		1			
Pine marten	SC, AS	S	1			
Ringtail	SU	S	1			
Lynx	S&M	U	1			
FISH						
Coho salmon	FP, SC, AS	D	3			
Umpqua cutthroat trout	FP	D	_3			
Steelhead trout (winter run)	AS	D	3			
Pacific lamprey	FC	D	3			
Umpqua chub	FC, SV	S	1			
Burnells' false water penny beetle	FC	U	1			
OTHER						
Denning's agapetus caddisfly	FC	U	1			
Green Springs Mtn. farulan caddisfly	FC	U	1			

SPECIAL STATUS SPECIES SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223)							
SPECIES (common name)	STATUS	PRESENCE	MONITORING LEVEL				
Schuh's homoplectran caddisfly	FC	U	1				
Obrien rhyacophilan caddisfly	FC	U	1				
Siskiyou caddisfly	FC	U	1				
Alsea ochrotichian micro caddisfly	FC	· U	1				
Franklin's bumblebee	FC	U	1				
Oregon pearly mussel	FC	U	1				
VASCULAR PLANTS		114 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
Candystick	S&M	Ü	1				
Wayside aster	FC	Ŭ	1				
Clustered lady-slipper orchid	S&M	U	1				
Mountain lady-slipper orchid	S&M	U	1				

STATUS ABBREVIATIONS:

FE -- Federal Endangered

FT -- Federal Threatened

FP -- Federal Proposed

FC -- Federal Candidate

SE -- State Endangered

ST -- State Threatened

SC -- ODFW Critical

SV -- ODFW Vulnerable

SP -- ODFW Peripheral/Naturally Rare

SU -- ODFW Undetermined

BS -- Bureau Sensitive

AS -- Assessment Species (BLM)

S&M--Survey and Manage (ROD)

PRESENCE ABBREVIATIONS:

D -- Documented

S -- Suspected, habitat present

U -- Uncertain

MONITORING LEVELS:

N -- No surveys done or planned

1 -- Literature search only

2 -- One field search done3 -- Some surveys completed

4 -- Protocol completed

Appendix B - Late-Successional Associated Species

LATE-SUCCESSIONAL ASSOCIATED SPECIES KNOWN OR SUSPECTED TO OCCUR WITHIN THE SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223) MONITORING SPECIES (common name) **HISTORY PRESENCE LEVEL** BIRDS Hermit thrush Y D 3 Brown creeper Y D 3 Vaux's swift Y 3 D Y Northern flicker 3 D Y 3 Hermit warbler D Western flycatcher Y D 3 Hammond's flycatcher Y 3 D Swainson's thrush Y 3 D Red crossbill Ν S 3 Y 3 Red-breasted nuthatch D Chestnut-backed chickadee Y 3 \mathbf{D} Hairy woodpecker Y 3 D Black-capped chickadee Y D 3 Golden-crowned kinglet Y D 3 White-breasted nuthatch Y 3 D Red-breasted sapsucker Y 3 D Barred owl Y 3 D Winter wren Y D 3 Warbling vireo Y D 3 Wilson's warbler Y D 3 AMPHIBIANS/REPTILES Rough-skinned newt Y D 3 Pacific giant salamander Y 3 D Y Northwestern salamander D 3

D

3

Y

Dunn salamander

LATE-SUCCESSIONAL ASSOCIATED SPECIES KNOWN OR SUSPECTED TO OCCUR WITHIN THE SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223) **MONITORING HISTORY PRESENCE** SPECIES (common name) LEVEL MAMMALS Roosevelt elk Y D 3 Western red-backed vole Y D 3 Y Townsend's chipmunk D 3 Northern flying squirrel Y D 3 Y D 3 Dusky-footed woodrat Shrew-molc Y D 3 Y Deer mouse D 3 FISH Chinook salmon Y D 3 OTHER Traveling sideband (land snail) S Ν N Siskiyou hesperian (land snail) N S N VASCULAR PLANTS Alaska bog-orchid Y D 1 Y Alpine pyrola \mathbf{D} 1 Y Beargrass D 1 Fairy-slipper Y D 1 Great wood-sorrel Y D 1 Ground-cone Y D 1 Y D 1 Indian-pipe Little prince's pine Y D 1 Marbled wild ginger Y D 1 Oregon fairy-bell Y D 1 Pacific yew Y D 1 Y Phantom-orchid D 1 Red huckleberry Y D 1

LATE-SUCCESSIONAL ASSOCIATED SPECIES KNOWN OR SUSPECTED TO OCCUR WITHIN THE SOUTH UMPQUA RIVER/GALESVILLE LSR (RO223)						
SPECIES (common name)	HISTORY	PRESENCE	MONITORING LEVEL			
Snowplant	Y	D	1			
Spotted coral-root	Y	D	1			
Trail-plant	Y	D	1			
Western maidenhair-fern	Y	D	1			
Western prince's pine	Y	D	1			
Western rattlesnake-plantain	Y	D	1			
Western redcedar	Y	D	1			
Whipplevine	Y	D	1			
White vein pyrola	Y	D	1			
Wild ginger	Y	D	1			
Yerba buena	Y	D	1			

PRESENCE ABBREVIATIONS:

HISTORY ABBREVIATIONS:

D -- Documented

S -- Suspected, habitat present

N -- No historic/chance/or protocol sightings

U -- Uncertain

Y -- Some historic/chance/or protocol searches done, species

found

I -- Intense searches/protocols done, species found

MONITORING LEVELS:

N -- No surveys done or planned

- 1 -- Literature search only
- 2 -- One field search done
- 3 -- Some surveys completed
- 4 -- Protocol completed

Appendix C - Common and Scientific Names

COMMON AND SCIENTIFIC NAMES SOUTH UMPQUA RIVER/GALESVILLE LSR ASSESSMENT (RO223)				
SPECIES (common name) ¹	SCIENTIFIC NAME			
BIRDS				
American white pelican	Pelecanus erythrorhynchos			
Bald eagle	Haliaeetus leucocephalus			
Peregrine falcon	Falco peregrinus anatum			
Mountain quail	Oreortyx pictus			
Barred owl	Strix varia			
Northern spotted owl	Strix occidentalis caurina			
Flamulated owl	Otus flammeolus			
Great gray owl	Strix nebulosa			
Northern pygmy owl	Glaucidium gnoma			
Northern saw-whet owl	Aegolius acadicus			
Vaux's swift	Chaetura vauxi			
Northern flicker	Colaptes auratus			
Black-backed woodpecker	Picoides arcticus			
Three-toed woodpecker	Picoides tridactylus			
Red-breasted sapsucker	Sphyrapicus ruber			
Pileated woodpecker	Dryocopus pileatus			
Lewis' woodpecker	Melanerpes lewis			
Acorn woodpecker	Melanerpes formicivorous			
Hairy woodpecker	Picoides villosus			
Purple martin	Progne subis			
Pacific slope (western) flycatcher	Empidonax difficilis			
Hammond's flycatcher	Empidonax hammondii			
Chestnut-backed chickadee	Parus rufuscens			
Black-capped chickadee	Parus atricapillus			
Pygmy nuthatch	Sitta pygmaea			
White-breasted nuthatch	Sitta carolinensis			

COMMON AND SCIENTIFIC NAMES SOUTH UMPQUA RIVER/GALESVILLE LSR ASSESSMENT (RO223) SPECIES (common name)¹ SCIENTIFIC NAME Red-breasted nuthatch Sitta canadensis Brown creeper Certhia americana Winter wren Troglodytes troglodytes Golden-crowned kinglet Regulus satrapa Western bluebird Sialia mexicana Swainson's thrush Catharus ustulatus Hermit thrush Catharus guttatus Vireo gilvus Warbling vireo Dendroica occidentalis Hermit warbler Wilson's warbler Wilsonia pusilla Red crossbill Loxia curvirostra AMPHIBIANS AND REPTILES Rough-skinned newt Taricha granulosa Pacific giant salamander Dicamptodon tenebrosus Ambystoma grasilis Northwestern salamander Dunn salamander Plethodon dunni Del Norte salamander Plethodon elongatus Southern torrent salamander Rhyacotriton variegatus Clouded salamander Aneides ferreus Rana boylii Foothill yellow-legged frog Red-legged frog Rana aurora Tailed frog Ascaphus truei Northern sagebrush lizard Sceloporus graciosus Western pond turtle Clemmys marmorata Sharptailed snake Contia tenuis

COMMON AND SCIENTIFIC NAMES SOUTH UMPQUA RIVER/GALESVILLE LSR ASSESSMENT (RO223)				
SPECIES (common name) ¹	SCIENTIFIC NAME			
California mountain kingsnake	Lampropeltis zonata			
Common kingsnake	Lampropeltis getulus			
MAMMALS				
Roosevelt elk	Cervus elaphus			
Shrew-mole	Neurothrichus gibbsii			
Townsend's big-eared bat	Plecotus townsendii			
Yuma myotis	Myotis yumanensis			
Fringed myotis	Myotis thysanodes			
Pacific pallid bat	Antrozous palidus			
Silver haired bat	Lasionycterus noctivagans			
Long-eared myotis	Myotis evotus			
Long-legged myotis	Myotis volans			
Ringtail	Bassariscus astutus			
American marten	Martes americana			
Fisher	Martes pennanti			
Lynx	Lynx canadensis			
Townsend's chipmunk	Tamias townsendii			
Northern flying squirrel	Glaucomys sabrinus			
Deer mouse	Peromyscus maniculatus			
Dusky-footed woodrat	Neotoma fuscipes			
White-footed vole	Phenacomys albipes			
Red tree vole	Phenacomys longicaudus			
Western red-backed vole	Clethrionomys californicus			
FISH				
Pacific lamprey	Lampetra tridentada			
Chinook salmon	Onchorynchus tshawytscha			
Coho salmon	Onchorynchus kisutch			
Umpqua cutthroat trout	Onchorynchus clarlki			

COMMON AND SCIENTIFIC NAMES SOUTH UMPQUA RIVER/GALESVILLE LSR ASSESSMENT (RO223)				
SPECIES (common name) ¹	SCIENTIFIC NAME			
Steelhead trout (winter run)	Onchorynchus mykiss			
Umpqua chub	Oregonichthys kalawatseti			
INVERTEBRATES				
Traveling sideband (land snail)	Monadenia fidelis celeuthia			
Siskiyou hesperian (land snail)	Vespericola sierrana			
Oregon pearly mussel	Pisidium ultramontanum			
Denning's agapetus caddisfly	Agapetus denningi			
Green Springs mtn. farulan caddisfly	Farula davisi			
Schuh's homoplectran caddisfly	Homoplectra schuhi			
Obrien rhyacophilan caddisfly	Rhyacophila colonus			
Siskiyou caddisfly	Tinodes siskiyou			
Alsea ochrotrichian micro caddisfly	Ochrotrichia alsea			
Vertree's ochrotrichian microcaddisfly	Ochrotrichia vertreesi			
Vertree's ceraclean caddisfly	Ceraclea(+Athripsodes) vertreesi			
Mt. Hood primitive brachycentridp caddisfly	Eobrachycentrus gelidae			
Burnelis' false water penny beetle	Acneus burnelli			
Franklin's bumblebee	Bombus franklini			
VASCULAR PLANTS ²				
Alaska bog-orchid	Haberia unalascensis			
Alpine pyrola	Pyrola assarifola			
Beargrass	Xerophyllum tenax			
Candystick	Allotropa virgata			
Clustered lady-slipper orchid	Cypripedium fasciculatum			
Fairy-slipper	Calypso bulbosa			
Great wood-sorel	Oxalis trillifolia			
Ground cone	Boschniakia strobilacea			
Indian pipe	Monotropa uniflora			
Little prince's pine	Chimaphila menziesii			

COMMON AND SCIENTIFIC NAMES SOUTH UMPQUA RIVER/GALESVILLE LSR ASSESSMENT (RO223)				
SPECIES (common name) ¹	SCIENTIFIC NAME			
Marbled wild ginger	Asarum hartwegii			
Mountain lady-slipper orchid	Cypripedium montanum			
Oregon fairy-bell	Disporum hookerii oreganum	\Box		
Pacific yew	Taxus brevifolia			
Phantom orchid	Eburophyton austinae			
Red huckleberry	Vaccinium parvifolium			
Snowplant	Synthyris reniformes			
Spotted coral-root	Corallorhiza maculata			
Trail-plant	Adenocaulum bicolor			
Western maidenhair-fern	Adiantum pedatum			
Western prince's pine	Chimaphila umbellata			
Western rattlesnake-plantain	Goodyeara oblongifolia			
Western redcedar	Thuja plicata			
Whipplevine	Whipplea modesta			
White vein pyrola	Pyrola picta	\neg		
Wild ginger	Asarum caudatum			
Yerba buena	Satureja douglasii			

Animal species listed in taxonomic order within each heading (mammals, birds, etc).

Vascular plants listed in alphabetical order of the common name.

Appendix D - Evaluation Criteria for Treatment Priorities Near Known Spotted Owl Nest Sites in the South Umpqua River/Galesville LSR

The purpose of Appendix D is to list information about the spotted owl sites located within the South Umpqua River/Galesville LSR. The data helps to create a priority list that would guide where projects may occur to attain Late-Successional Reserve goals. Given the large database currently available on the location and distribution of owls within the LSR and amount and location of forest age classes on the landscape, it is feasible to choose project areas with specific purposes and goals in mind.

The following is an example of the priority selection process and owl site evaluation:

- a. Select owl sites that fall below habitat acre threshold of 1335 acres within 1.3 miles of an owl site (Table D-1). Sites that are currently below the 30 percent level should be assigned priority 1. These sites are also likely to be below the 500 acre suitable habitat threshold within .7 mile radius around known owl sites. Sites at the 30-40 percent level would be priority 2, and greater than 40 percent priority 3 for possible forest stand manipulation.
- b. Priority sites (1, 2, or 3) should be further evaluated by including the reproductive history of the site, occupancy ranking, history ranking, and number of years site has been occupied by a pair. These variables are listed in Table D-2.
- c. Owl sites selected may be further evaluated by determining the seral age classes within the radii around the owl sites. The purpose here is to locate forest age classes adjacent to suitable habitat or within the 0.7 mile or 1.3 mile radii that may be manipulated to accelerate stand development toward late-successional characteristics.
- d. Review connectivity information previously developed and overlay over spotted owl site information. The goal here is to evaluate the connectivity of suitable spotted owl habitat to other late-successional habitat in the vicinity of the owl sites. In general terms, locate older age class stands (80+ years old) and analyze how the current blocks are connected to other similar blocks.

The evaluation should answer the following questions:

- 1. Does the provincial radii of owl sites contain forest stands suitable for manipulation that may accelerate attaining older age class characteristics?
- 2. Will stand manipulation aid in the development of connectivity between current owl site habitat and adjacent habitat?
- 3. Where is the connectivity needed, in the upland or in the riparian area of the drainage?
- 4. Is suitable habitat development needed to connect the LSR to other suitable habitat? To connect one home range to another home range? What direction is important (east, west, north, south)?
- 5. Is stand manipulation needed? What are the pros and cons of the proposed action?

Table D-1
Suitable Spotted Owl Habitat Conditions Around Known Owl Nest Sites in the South Umpqua River/Galesville LSR.

	GIS Generated Owl Sites a			Spotted Owl Hal	oitat	
MSNO	Owl Site Name	Acres	Acres	Pr	ovincial Radius 1.	3 Miles
		0-0.7M	0-1.3M	<30%	30-40%	>40%
MEDFORD D	STRICT BLM	\$1.67.08.656.648		tri Göreti		
2073	Azalea Peak	313	903	Х		
0933	Black Jack	458	1306		х	
2015	Bull Run	510	1621			х
1953	Fizzleout	162	581	Х	, <u>-</u>	
2406	Gray Power	635	1638			Х
0943	Jones Creek	349	901	Х		
2214	Mcadow Creek	110	324	Х		
2273	Mickey	58	411	Х		
0934	Negro Creek	368	936	х		
2617	Power Transmission	129	244	Х		
8022	Russell Creek	265	455	Х		
2070	Sitting Bull	207	648	Х		
2620	Snowy Owl	443	945	Х		
0099	Starved Bull	443	942	х		
0935	Thinhorse	351	721	х		
0894	Ump Cow	150	241	Х		
0078	Woodford	222	876	х		
ROSEBURG I	DISTRICT BLM	10000000				
0365-A	Bear Gulch	563	1264		х	
3104	Bear Paw	348	1285		х	
3906	E. Fork Poole Creek	458	1036		х	
2087	E. Stouts Creek	246	846	Х		_
1932	Hyde Ridge	353	765	Х		
0296	Mighty Fine	374	894	X		
0283	Millers Mine	70	634	Х		
3909	No Doubt Stout	277	735	Х		
1933	Oshea Corners	232	947	х		
0298-A	Oshea Creek	398	1095		х	
0363	Pinfeather	219	652	х		

	GIS Generated Owl Sites		Spotted Owl Ha	bitat			
MSNO	Owl Site Name	Acres	Acres	Pr	Provincial Radius 1.3 Miles		
		0-0.7M	0-1.3M	<30%	30-40%	>40%	
1997	Poole Creek	520	1478			х	
0297	Shively Forks	289	594	х			
0289	Shively Poole	151	766	х			
1813-A	Stouts Creek	103	1028	х			
1934-B	Stouts Meadow	499	1080		х		
0364	Sweat Creek	235	695	х			
4052	Three Stouts	225	621	x			
0366-C	Turkey Creek	301	1008	х			
1935	West Stouts	361	1293		Х		
U.S. FOREST	SERVICE ¹						
408 ¹	Beaver Creek	641	1953			х	
423	Buzzard Rock	610	1479			х	
401	Drew Creek	371	1619			х	
427	Downtown Tiller	601	1491			х	
407	East Fork Cow Creek	810	2033			х	
400	Granite Creek	670	2017			х	
405	Hatchet Creek	722	2094			х	
420	Hatchet Creek South	883	2309			х	
426	Stauch Ranch	460	1100		Х		

Master site identification numbers used by the Forest Service are unique to the Forest Service and do not represent U.S. Fish and Wildlife Service (USFWS) identification numbers.

Table D-2
Spotted Owl Activity Center Ranking Data within the South Umpqua River/Galesville LSR.
South River Field Office (1995)

		<u></u> _							
MSNO	YEAR SITE WAS LOCATED	LAST YEAR OF KNOWN ACTIVE PAIR (PAIR STATUS + # JUVENILES)	LAST YEAR OCCUPIED & (PAIR STATUS)	NO. OF YEARS OF REPRODUCTION/ (PAIR STATUS=P) SINCE 1985	ACRES IN PROVINCE RADIUS (1.3 MILES)	ACRES IN	OCCUPANCY RANK	ACRES RANK	HISTORY RANK
0283	1976	ND	(ND)	0/0	634	70	2	D	3
0289	1976	1990 (P+0J)	94(M+F)	2/8	766	151	1	D	2
0296	1977	1994(P+2J)	94(P)	4/7	894	374	1	D	1
0297	1976	1994(P+2J)	94(P)	8/8	594	289	1	D	1
0298A	1992	1992(P+2J) ·	94(P)	1/2	1095	398	1	В	1
0363	1981	PU	92(PU)	0/0	652	219	1	D	3
0364	1981	1991(P)	94(M+F)	0/4	695	235	1	D	3
0365A	1992	1994(P+2J)	94 (P)	3/5	1264	563	1	A	1
0366C	1990	1994 (P+2J)	94 (P)	7/11	1008	301	1	D	1
1813A	1989	1989(P+2J)	89(P)	1/3	1028	103	3	В	3
1932	1987	1993(P+2J)	94 (P)	4/7	765	353	1	D	1
1933	1986	1986(P+2J)	94 (P)	1/6	947	232	1	D	2
1934B	1994	1994(P+2J)	94 (P))	3/5	1080	499	1	В	1
1935	1987	1992(P)	9 4(M+F)	1/4	1293	361	1	В	2
1997	1988	1989	94 (M+F)	1/4	1478	520	1	A	2
2087	1989	1989(P+2J)	94 (P)	1/5	846	264	1	D	2
3104	1986	1993(P)	1993(P)	3/5	1285	348	1	A	2
3906	1994	1994(P+2J)	1994(P)	1/1	1036	458	1	В	1
3909	1992	1994(P)	1994(P)	0/1	735	277	1	D	3
4052	1993	1994(P+1J)	1994(P)	1/1	621	225	1	D	3

Table D-2
Spotted Owl Activity Center Ranking Data within the South Umpqua River/Galesville LSR.
Glendale Field Office (1995)

MSNO	YEAR SITE WAS LOCATED	LAST YEAR OF KNOWN ACTIVE PAIR (PAIR STATUS -# JUVENILES)	LAST YEAR OCCUPIED & (PAIR STATUS)	N. OF YEARS OF REPRODUCTION / (PAIR STATUS=P) SINCE 1985	ACRES IN PROVINCE RADIUS (1.3 MILE)S	ACRES IN .7M RADIUS	OCCUPANCY RANK	ACRES RANK	HISTORY RANK
2073	1989	92 (P+2J)	94 (P)	2/6	903	313	1	D	2
0933	1980	93 (P+1J)	94 (P)	3/6	1306	458	1	В	2
2015	1988	92 (P+1J)	94 (P)	3/7	1621	510	1	А	2
1953	1987	92 (P+1J)	94 (P)	2/8	581	162	1	D	3
2406	1991	93 (P)	95 (P)	0/2	1638	635	2	A	3
0943	1980	92 (P+IJ)	94 (P)	2/5	901	349	2	D	2
2214	1990	90 (P+1J)	90 (P)	1/1	324	110	3	D	3
2273	1990	90 (P+2J)	94 (P)	1/3	411	58	2	D	3
0934	1980	90 (P+2J)	93 (P)	2/4	936	368	t	D	2
2617	1991	91 (P+1J)	95 (M)	1/2	244	129	2	D	3
8022	1990	PU	93 (M)	0/0	455	265	2	D	3
2070	1989	94 (P+1J)	94 (P+1J)	4/5	648	207	1	D	1
2620	1991	93 (P+1J)	94 (P)	3/4	945	443	1	D	1
0099	1974	93 (P+2J)	94 (P)	3/6	942	443	1	D	2
0935	1980	90 (P+2J)	94 (P)	1/6	721	351	1	D	3
0078	1974	92 (P+1J)	94 (P)	1/4	876	222	1	D	2
0894	1978	PU	81 (ND)	0/0	241	150	3	D	3

Table D-2

Spotted Owl Activity Center Ranking Data within the South Umpqua River/Galesville LSR.

Forest Service Lands,1

MSNO	YEAR SITE WAS LOCATED	LAST YEAR OF KNOWN ACTIVE PAIR (PAIR STATUS - # JUVENILES)	LAST YEAR OCCUPIED & (PAIR STATUS)	N. OF YEARS OF REPRODUCTION/ (PAIR STATUS=P) SINCE 1985	ACRES IN PROVINCE RADIUS (1.3 MILES)	ACRES IN .7M RADIUS	OCCUPANCY RANK	ACRES RANK	HISTORY RANK
400	ND	1994(P+2J)	1994(P)	2/-	2017	670		Α	
401	ND	1994(P+0J)	1994(P)	2/-	1619	371		В	
405	ND	1994(P+1J)	1994(P)	3/-	2094	722		Α	
407	ND	1994(P+0J)	1994(P)	0/-	2033	810		Α	
408	ND	1994(Р+1Л)	1994(P)	1/-	1953	641		A	
420	ND	ND	ND	1/-	2309	883		A	
423	ND	1994((P+2J)	1994(P)	2/-	1479	610		А	
426	ND	ND	ND	0/-	1100	460		В	
427	ND	ND	ND	2/-	1491	601		Α	

Occupancy and history ranking not available for FS sites at this time.

Table D-2 Definitions:

OCCUPANCY RANK - 1: Sites with this ranking have current occupancy and have been occupied by a single or pair for the last 3 years; 2: Sites with this ranking have been occupied in the past, show sporadic occupancy by a single owl or an owl pair, may be currently occupied; 3: Sites with this ranking have not been occupied during the last 3 years.

LAST YEAR OF KNOWN ACTIVE PAIR - Gives the year, pair status and young produced; NP: site has not had a pair

ACRES RANK - A: Regarding suitable spotted owl habitat, these sites have greater than 1000 acres in the provincial radius and greater than 500 acres within a .7 mile radius; B: Greater than 1000 acres in the provincial radius and greater than 500 acres in the .7 mile radius; D: Less than 1000 acres in the provincial radius and less than 500 acres in the .7 mile radius; D: Less than 1000 acres in the provincial radius and less than 500 acres in the .7 mile radius.

HISTORY RANKING - This ranking includes occupancy ranking, reproduction data, acres ranking, habitat evaluation, field experience about the site (location, quality, forest structure etc.). 1: A site considered stable due to being consistently occupied by spotted owls and has been producing young consistently; 2: site is consistently used by spotted owls but reproduction sporadic; 3: site shows some reproduction, occupation sporadic or no occupation.

STATUS = M: MALE; F: FEMALE; J: JUVENILE; P: PAIR STATUS; (M+F): TWO ADULT BIRDS, PAIR STATUS UNKNOWN; PU: PAIR STATUS UNDETERMINED, INCOMPLETE OR NO DATA.(ND)

Appendix E - Quarries

Quarry #	Quarry Name	TRS TANKS	Status	In Riparian Reserve?	- Probability		
Medford BLM Quarries							
10	Green Horse	T32S, R4W, section 23	Inactive	No, on ridge	Low		
12	Green Mountain	T32S, R4W, section 27	Active	No, high on ridge	High		
13	Woodford	T32S, R5W, section 33	Active	No	High		
16	Quines Creek	T33S, R5W, section 1	Active	Yes	High		
40	Quines Creek #2	T33S, R5W, section 3	Depleted	n/a	None		
43	Russell Crk Road	T32S, R5W, section 14	Depleted	n/a	None		
45	Bull Run Pit	T32S, R5W, section 25	Active	Yes	Medium		
46	Upper Bull Run	T32S, R4W, section 31	Prospect	No	Low		
47	Quartz Mill	T32S, R4W, section 32	Inactive	n/a	n/a		
48	Bull Run-Starveout	T33S, R4W, section 5	Active	No, on ridge	Medium- high		
49	Starveout AP	T32S, R4W, section 33	Explored negative	n/a	n/a		
50	Old Borrow Pit	T32S, R4W, section 33	Inactive	No	Very low		
51	Lil Boulder	T32S, R4W, section 33	Inactive	No	Low (could be rehab.)		
52	Starveout- Klover Jones	T32S, R4W, section 33	Active	No	High		
53	Upper Starveout Quarry	T33S, R4W, section 4	Explored negative	n/a	n/a		
54	Hogum-Starveout Saddle	T32S, R4W, section 33	Reclaimed	n/a	n/a		

Quarry #	Quarry . Name :-	TRS	Status	In Riparian Reserve ⁹³	Probability of Use
55	Starved Bull	T32S, R4W, section 30	Depleted Reclaimed	n/a	n/a
56	Whitehorse Creek	T32S, R4W, section 15	Active	Yes	Low
58	Gage Station	T32S, R4W, section 11	Prospect	No	Low
59	Black Jack	T32S, R4W, section 11	Active	No	Low- medium
60	C&D Greenstone Pit	T32S, R4W, section 2	Inactive	Yes	None
61	Snow Spring	T32S, R3W, section 19	Active	No	Medium
62	Goolaway Gap	T32S, R3W, section 30	Prospect	No	Low
63	Ump-Cow Divide	T31S, R4W, section 27	Active	No	Low
64	McGinnis	T31S, R4W, section 24	Reclaimed	No	None
65	McBug	T31S, R4W, section 25	Reclaimed	No	None
85	Tennessee Ridge	T33S, R5W, section 3	Prospect	No	Low
103	Unnamed	T32S, R4W, section 7	Prospect	No	Low
104	Russel Creek	T31S, R4W, section 29	Active	No, high on ridge	High
105	Azalea Peak	T32S, R5W, section 1	Active	No, high on ridge	High
111	Unnamed	T32S, R4W, section 30	Active	No, high on ridge	Low
112	Unnamed	T32S, R5W, section 25	Prospect	No	None
113	Fizzle Out	T32S, R4W, section 21	Depleted, reclaiming	n/a	n/a (none.)
119	McCullum Creek	T32S, R5W, section 33	Inactive	No	Very low

Quarry #	Quarry 1 Name	TRS Zija	Status (In Riparian + Reserve?	Probability of Use
128	Unnamed	T32S, R4W, section 32	Reclaimed	n/a	n/a
129	Green Cedar Alt.	T32S, R4W, section 27	Prospect	No, high on ridge	Low
130	Whitehorse Pro. #A	T32S, R4W, section 15	Prospect	Yes	Very Low
131	Whitehorse Pro. #2	T32S, R4W, section 15	Prospect	Yes	Low
132	Rib	T32S, R4W, section 32	Prospect	n/a	n/a
356	Bull Run Three	T33S, R4W, section 4	Explored negative	n/a	п/а
621	Needs Inventory	T33S, R4W, section 3	Inactive	Yes	Low
628	North Castle	T31S, R3W, section 26	Active	No	Medium
629	USFS	T31S, R3W, section 32	Inactive	No	Low
630	Meadow	T31S, R3W, section 19	Active	No	Medium- high
		Forest Service Q	Quarries		
210303	Drew Lake	T32S, R2W, section 9	Active	No	Low
210404	Hatchet	T31S, R2W, section 8	Active	No	Medium High
210201	Rowley	T31S, R2W, section 34	Active	No	Low
210205	Stauch	T32S, R3W, section 3	Active	No	Medium
210204	Тот	T32S, R2W, section 3	Active	No	Medium
210301	C & D	T31S, R2W, section 31	Private & USFS Active	No	Low

In Riparian Reserve? - Is the quarry within 1 or 2 site potential trees depending upon whether the stream is fish-bearing?

Appendix F - REO Exemption Criteria for Specific Silvicultural Activities

- April 20, 1995 Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from REO Review (Young stand thinning, release, and reforestation and revegetation)
- July 9, 1996 Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from REO Review (Commercial thinning)
- September 30, 1996 Amendment to "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" of July 9, 1996

REGIONAL ECOSYSTEM OFFICE

P.O. Box 3623 Portland, Oregon 97208 (503) 326-6265 FAX: (503) 326-6282

MEMORANDUM

DATE: April 20, 1995

To:

Regional Interagency Executive Committee

(See Distribution List)

FROM:

Donald R. Knowles, Executive Director

SUBJECT:

Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from

REO Review

Pages C-12 and C-26 of the Record of Decision (ROD) for the Northwest Forest Plan state that "[t]he Regional Ecosystem Office may develop criteria that would exempt some activities from review." Enclosed are criteria that exempt certain young-stand thinning, release, and reforestation projects that are proposed in Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) from review by the Regional Ecosystem Office (REO). These criteria were developed by an interagency work group and the REO based on the review of silvicultural projects, field visits, and discussions with agencies and technical specialists. The REO may expand the review exemption criteria as experience with additional forest management activities is gained. Please distribute the attached REO review exemption criteria to the field.

It is important to note that these criteria do not affect the kind of activities the ROD permits within LSRs and MLSAs. The criteria apply only to the requirement for REO review of silvicultural activities in LSRs and MLSAs and only to a specific subset of silvicultural treatments. It should also be noted that compliance with the ROD's standards and guidelines and other statutory and regulatory requirements is not affected by these exemption criteria. For example, requirements to do watershed analyses and Endangered Species Act consultation are not affected by the REO review exemption criteria.

Enclosure

cc:

IAC Members (See Distribution List) 362/ly

DISTRIBUTION LIST

Date: April 20, 1995

Subject: Criteria to Exempt Specific Silvicultural Activities in LSRs and MLSAs from REO Review

TO: REGIONAL INTERAGENCY EXECUTIVE COMMITTEE

Anita Frankel, Director, Forest and Salmon Group, Environmental Protection Agency John Lowe, Regional Forester, USDA Forest Service, R-6 Stan Speaks, Area Director, Bureau of Indian Affairs Michael Spear, Regional Director, U.S. Fish & Wildlife Service William Stelle, Jr., Regional Director, National Marine Fisheries Service William Walters, Acting Regional Director, National Park Service Elaine Zielinski, State Director, Bureau of Land Management, OR/WA

CC: OTHER MEMBERS OF INTERGOVERNMENTAL ADVISORY COMMITTEE

California

Francie Sullivan, Shasta County Supervisor
Terry Gorton, Assistant Secretary, Forestry and Rural Economic Dev., California Resource Agency

Oregon

Rocky McVay, Curry County Commissioner
Paula Burgess, Federal Forest and Resource Policy Advisor, Office of the Governor

Washington

Harvey Wolden, Skagit County Commissioner
Amy F. Bell, Deputy Supervisor for Community Relations, WA Dept. of Natural Resources
Bob Nichols, Senior Executive Policy Assistant, Governor's Office (Alternate)

Tribes

Greg Blomstrom, Planning Forester, CA Indian Forest & Fire Mgmt. Council Mel Moon, Commissioner, NW Indian Fisheries Commission
Jim Anderson, Executive Director, NW Indian Fisheries Commission (Alternate)
Gary Morishima, Technical Advisor, Intertribal Timber Council
Guy McMinds, Executive Office Advisor, Quinault Indian Nation

Federal Agencies

Michael Collopy, Director, Forest and Rangeland Ecosystem Science Center, National Biological Service Eugene Andreuccetti, Regional Conservationist, Natural Resources Conservation Service Bob Graham, State Conservationist, Natural Resources Conservation Service (Alternate) G. Lynn Sprague, Regional Forester, USDA Forest Service, R-5 (Alternate) Thomas Murphy, Director, Environmental Research Laboratory, Environmental Protection Agency Charles Philpot, Station Director, Forest Service, PNW Tom Tuchmann, Director, Office of Forestry and Economic Development (Ex Officio) Ed Hastey, State Director, Bureau of Land Management, CA (Alternate)

REO REVIEW EXEMPTION CRITERIA

BACKGROUND

Standards and Guidelines (S&Gs) in the "Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, (referred to as the ROD) provide that silvicultural activities within Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAS) are subject to review by the Regional Ecosystem Office (REO). The S&Gs also state that "REO may develop criteria that would exempt some activities [within LSRs and MLSAS] from review."

Based upon proposals submitted to REO for review, field visits, discussions with the agencies and technical specialists, and our understanding of LSR objectives, REO is hereby exempting the following types of activities from the REO review requirement stated on pages C-12 and C-26 of the ROD. Silvicultural projects meeting the following criteria are exempted from REO review because such projects have a high likelihood of benefitting late-successional forest characteristics.

Activities must still comply with all S&Gs in the ROD (e.g., initial LSR assessments, watershed analysis, riparian reserves) and with other statutory and regulatory requirements (e.g., National Forest Management Act, Federal Land Management Policy Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act). This exemption applies only to the REO review requirement found on pages C-12 and C-26 in the ROD. Silvicultural activities described in the S&Gs that do not meet the criteria listed below continue to be subject to REO review at this time.

Silvicultural treatments in LSRs and MLSAs are exempted from REO review (ROD, pages C-12 and C-26), where the agency proposing the treatments finds that the following criteria are met:

- 1. <u>YOUNG-STAND THINNING</u>, commonly referred to as TSI or precommercial thinning, where:
 - a. Young stands, or the young-stand component (understory) of two-storied stands, is overstocked. Overstocked means that reaching the management objective of late-successional conditions will be significantly delayed, or desirable components of the stand may be eliminated, because of stocking levels. The prescription should be supported by empirical information or modeling (for similar, but not necessarily these specific, sites) indicating the development of late-successional conditions will be accelerated or enhanced.
 - b. Cut trees are less than 8" dbh, and any sale is incidental to the primary objective.
 - c. Tracked, tired, or similar ground-based skidders or harvesters are not used.
 - d. Treatments promote a natural species diversity appropriate to meet late-successional objectives; including hardwoods, shrubs, forbs, etc...
 - e. Treatments include substantially varied spacing in order to provide for some very large trees as quickly as possible, maintain areas of heavy canopy closure and

decadence, and encourage the growth of a variety of species appropriate to the site and the late-successional objective.

- f. Treatments minimize, to the extent practicable, the need for future entries.
- g. Cutting is by hand tools, including chain saws.
- 2. RELEASE, also commonly referred to as TSI, where:
 - a. There is undesirable vegetation (competition) which delays attainment of the management objective of late-successional conditions, or desirable components of the stand may be eliminated, because of such competition. The prescription should be supported by empirical information or modeling (for similar, but not necessarily these specific, sites) indicating the development of late-successional conditions will be accelerated or enhanced.
 - b. Cut material is less than 8" dbh, and any sale is incidental to the primary objective.
 - c. Tracked, tired, or similar ground-based skidders or harvesters are not used.
 - d. Treatments promote a natural species diversity appropriate to meet late-successional objectives, including hardwoods, shrubs, forbs, etc.
 - c. Cutting is by hand tools, including chain saws.
- 3. REFORESTATION AND REVEGETATION, including incidental site preparation, release for survival, and animal damage control, where:
 - a. No site preparation is required other than hand scalping.
 - b. Reforestation is necessary to quickly reach late-successional conditions, protect site quality, or achieve other ROD objectives.
 - c. Treatments promote a natural species diversity appropriate to meet late-successional objectives, including hardwoods, shrubs, forbs, etc.
 - d. Treatments, either through spacing, planting area designation, or expected survival or growth patterns, result in substantially varied spacing in order to provide for some very large trees as quickly as possible, create areas of heavy canopy closure and decadence, and encourage the growth of a variety of species appropriate to the site and the late-successional objective.
 - c. Treatments minimize, to the extent practicable, the need for future entries.

REGIONAL ECOSYSTEM OFFICE

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MEMORANDUM

DATE: July 9, 1996

To: Regional Interagency Executive Committee (RIEC)

Ken Feigner, Director, Forest & Salmon Group, Environmental Protection Agency

Robert W. Williams, Regional Forester, R-6, Forest Service Stan M. Speaks, Area Director, Bureau of Indian Affairs

Michael J. Spear, Regional Director, U.S. Fish & Wildlife Service

William Stelle, Jr., Regional Director, National Marine Fisheries Service

William C. Walters, Deputy Field Director, National Park Service

Elaine Y. Zielinski, State Director, Oregon/Washington, Bureau of Land Management

FROM: Donald R. Knowles, Executive Director

SUBJECT: Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and

Managed Late-Successional Areas from Regional Ecosystem Office Review

Enclosed are criteria that exempt certain commercial thinning projects in Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) from review by the Regional Ecosystem Office (REO), pursuant to pages C-12 and C-26 of the Northwest Forest Plan (NFP) Record of Decision (ROD). These criteria were developed by an interagency work group and the REO based on review of silvicultural projects, field visits, and comments from agencies, researchers, and technical specialists.

We believe we are ready for these exemptions. Several versions of these criteria have been distributed to your agencies and others for review over the last several months. The comments received have been used to help clarify and focus the criteria. Use of the criteria will expedite implementation of beneficial silvicultural treatments in LSRs and MLSAs. We suggest that you transmit them to your field units at your earliest convenience.

It is important to note that these criteria do not affect the kind of activities the *ROD* permits within LSRs and MLSAs. The criteria simply exempt a specific subset of silvicultural treatments from the requirement for project level REO review of silvicultural activities within LSRs and MLSAs. Please also note that compliance with the *ROD*'s standards and guidelines and other statutory and regulatory requirements is not affected by these exemption criteria. For example, requirements to do watershed analyses and Endangered Species Act consultation are not affected by the REO review exemption criteria.

We expect implementation monitoring procedures of the Northwest Forest Plan to select enough silvicultural projects within LSRs and MLSAs, both exempted and reviewed, to determine if actual projects meet standards and appropriate criteria. Obviously, if any of you have questions or comments about the attached, please call me directly at 503-326-6266, Dave Powers at 503-326-6271, or Gary S. Sims at 503-326-6274.

cc: IAC, RMC, LSR Workgroup

Enclosure

694/ly

Criteria Exempting Certain Commercial Thinning Activities From REO Review

Background

Standards and Guidelines (S&Gs) in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD) provide that silvicultural activities within Late-Successional Reserves (LSRs) and Managed Late-Successional Areas (MLSAs) are subject to review by the Regional Ecosystem Office (REO). The S&Gs also state that the REO may develop criteria that would exempt some activities (within LSRs and MLSAs) from review.

Based upon project proposals submitted to the REO for review, field visits, discussions with the agencies, researchers, and technical specialists, and our understanding of LSR objectives, the REO is hereby exempting certain commercial thinning activities (sometimes referred to as density management activities) from the REO review requirement (ROD, pages C-12 and C-26). Silvicultural projects meeting the criteria below are exempted from REO review because such projects have a high likelihood of benefiting late-successional forest conditions. Many of the commercial thinning proposals reviewed thus far by the REO have met these criteria.

In some cases the criteria refer to the "prescription." All silvicultural treatments within LSRs will be conducted according to a silvicultural prescription fully meeting agency standards for such documents. A description of the desired future condition (DFC), and how the proposed treatment is needed to achieve the DFC, are key elements in this prescription. The description of desired future condition should typically include desired tree species, canopy layers, overstory tree size (e.g., diameter breast height), and structural components such as the range of coarse woody debris (CWD) and snags.

Some elements of these exemption criteria may seem prescriptive, and reviewers suggested several changes to accommodate specific forest priorities. While such suggestions may have been within the scope of the S&Gs, there are several reasons they are not included here:

- These criteria are based on numerous submittals already reviewed by the REO and found to be consistent with the S&Gs. Other treatments, such as thinning with fire, may be equally appropriate. The REO simply has not had sufficient experience with such prescriptions within LSRs to write appropriate exemption criteria at this time. Agencies are encouraged to develop and submit such prescriptions for review. The REO will consider supplementing or modifying these criteria over time.
- These criteria apply range wide. It may be more appropriate to seek exemption at the
 time of LSR assessment review where specific vegetation types, provincial issues, or
 objectives do not fit within these criteria or where silvicultural prescriptions are
 needed other than as described below.
- These exemption criteria are not standards and guidelines, and projects meeting LSR
 objectives but not fitting these criteria should continue to be forwarded to the REO for
 review.

Four other key points about thinning are important to consider when developing thinning prescriptions:

- 1. We urge caution in the use of silvicultural treatments within LSRs. Silvicultural treatments within old habitat conservation areas (HCAs) and designated conservation areas (DCAs) were extremely limited, and many of the participants in the Forest Ecosystem Management Assessment Team/Supplemental Environmental Impact Statement (FEMAT/SEIS) process advanced good reasons for continuing such restrictions. Only high eastside risks and a case made that late-successional conditions could clearly be advanced by treatments in certain stand conditions led decision makers toward the current S&Gs. Note that the "examples" for the westside (S&Gs, page C-12) are for "even-age stands" and "young single-species stands." Agencies must recognize when younger stands are developing adequately and are beginning to become valuable to late-successional species. Such stands should be left untreated unless they are at substantial risk to large-scale disturbance.
- 2. Thinning can easily remove structural components or impede natural processes such as decay, disease, or windthrow, reducing the stand's value to late-successional forest-related species. Thinning prescriptions that say "leave the best, healthiest trees" could eliminate structural components important to LSR objectives.
- 3. While "historic" stand conditions may be an indicator of a sustainable forest, they are not the de facto objectives. The S&Gs require an emphasis toward late-successional conditions to the extent sustainable.
- 4. Treatments need to take advantage of opportunities to improve habitat conditions beyond "natural conditions." For example, exceeding "natural levels" of CWD within a 35-year-old stand can substantially improve the utility of these stands for late-successional forest-related species. Treatments must take advantage of opportunities to optimize habitat for late-successional forest-related species in the short term.

Relation to S&Gs and Other Exemption Criteria

Exempted thinnings must still comply with all pertinent S&Gs in the ROD (e.g., initial LSR assessments, watershed analyses, riparian reserves) and with other statutory and regulatory requirements (e.g., National Forest Management Act, Federal Land Management Policy Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act). Interagency cooperation, monitoring, and adaptive management are key components of the ROD and were key assumptions underlying the development of these criteria. Additionally, field units are strongly encouraged to engage in intergovernmental consultation when developing projects. This exemption applies only to the REO review requirement (ROD, pages C-12 and C-26). Many treatments not meeting these exemption criteria may be appropriate within LSRs and MLSAs, and these treatments remain subject to REO review. These exemption criteria are in addition to criteria issued April 20, 1995, for Young Stand Thinning, Release, and Reforestation and Revegetation, and are in addition to exemption criteria adopted through the LSR assessment review process.

EXEMPTION CRITERIA

Silvicultural treatments in LSRs and MLSAs are exempted from REO review (ROD, pages C-12 and C-26) where the agency proposing the treatments finds that <u>ALL</u> of the following criteria are met:

Objectives

1. The objective or purpose of the treatment is to develop late-successional conditions or to reduce the risk of large-scale disturbance that would result in the loss of key late-successional structure. Further, the specific treatment would result in the long-term development of vertical and horizontal diversity, snags, CWD (logs), and other stand components benefiting late-successional forest-related species. The treatment will also, to the extent practicable, create components that will benefit late-successional forest-related species in the short term.

Timber volume production is only incidental to these objectives and is not, in itself, one of the objectives of the treatment. Creation or retention of habitat for early successional forest-related species is not a treatment objective.

- 2. Negative short-term effects to late-successional forest-related species are outweighed by the long-term benefits to such species and will not lessen short-term functionality of the LSR as a whole.
- 3. The leave-tree criteria provide for such things as culturing individual trees specifically for large crowns and limbs and for the retention of certain characteristics that induce disease, damage, and other mortality or habitat, consistent with LSR objectives. "Healthiest, best tree" criteria typical of matrix prescriptions are modified to reflect LSR objectives.
- 4. Within the limits dictated by acceptable fire risk, CWD objectives should be based on research that shows optimum levels of habitat for late-successional forest-related species, and not be based simply on measurements within "natural stands." For example, recent research by Carey and Johnson in young stands on the westside indicates owl prey base increases as CWD (over 4") within Douglas-fir forests increases, up to 8- to 10-percent groundcover south of the town of Drain, Oregon, and 15-percent groundcover north of Drain, increasing to 15 to 20 percent in the Olympic Peninsula and Western Washington Cascades. Other references that could help identify initial considerations involving natural ranges of variability in CWD include Spies and Franklin, for discussions on Washington Cascades, Oregon Cascades, and Coast Ranges; and Graham, et al., for east of the Cascades.

If tree size, stocking, or other considerations preclude achievement of this objective at this time, the prescription includes a description of how and when it will be achieved in the future.

5. Agencies having an interest in LSR projects proposed under these criteria should continue to be given the opportunity to participate in project development.

Stand Attributes

- 1. The stand is currently **not** a complex, diverse stand that will soon meet and retain late-successional conditions without treatment.
- 2. West of the Cascades outside of the Oregon and California Klamath Provinces, the basal-area-weighted average age of the stand is less than 80 years. Individual trees exceeding 80 years in those provinces, or exceeding 20-inches dbh in any province, shall not be harvested except for the purpose of creating openings, providing other habitat structure such as downed logs, elimination of a hazard from a standing danger tree, or cutting minimal yarding corridors. Where older trees or trees larger than 20-inches dbh are cut, they will be left in place to contribute toward meeting the overall CWD objective. Thinning will be from below, except in individual circumstances where specific species retention objectives have a higher priority. Cutting older trees or trees exceeding 20-inches dbh for any purpose will be the exception, not the rule.
- 3. The stand is overstocked. Overstocked means that reaching late-successional conditions will be substantially delayed, or desirable components of the stand will likely be eliminated, because of stocking levels.

Treatment Standards

- 1. The treatment is primarily an intermediate treatment designed to increase tree size, crown development, or other desirable characteristics (S&Gs, page B-5, third paragraph); to maintain vigor for optimum late-successional development; to reduce large-scale loss of key late-successional structure; to increase diversity of stocking levels and size classes within the stand or landscape; or to provide various stand components beneficial to late-successional forest-related species.
- 2. The prescription is supported by empirical information or modeling (for similar, but not necessarily these specific sites) indicating that achievement of late-successional conditions would be accelerated.
- 3. The treatment is primarily an intermediate thinning, and harvest for the purpose of regenerating a second canopy layer in existing stands is no more than an associated, limited objective as described below under openings and heavily thinned patches.
- 4. The treatment will increase diversity within relatively uniform stands by including areas of variable spacing as follows:
 - Ten percent or more of the resultant stand would be in unthinned patches to retain processes and conditions such as thermal and visual cover, natural suppression and mortality, small trees, natural size differentiation, and undisturbed debris.
 - Three to 10 percent of the resultant stand would be in openings, roughly 1/4 to 1/2 acre in size to encourage the initiation of structural diversity.
 - Three to 10 percent of the resultant stand would be in heavily thinned patches (e.g., less than 50 trees per acre) to maximize individual tree development and encourage some understory vegetation development.

The treatment does not inappropriately "simplify" stands by removing layers or structural components, creating uniform stocking levels, or removing broken and diseased trees important for snag recruitment, nesting habitat, and retention of insects and diseases important to late-successional development and processes.

- 5. To the extent practicable for the diameter and age of the stand being treated, the treatment includes falling green trees or leaving snags and existing debris to meet or make substantial progress toward meeting an overall CWD objective.
- 6. Snag objectives are to be identified as part of the DFC. Prescriptions must be designed to make substantial progress toward the overall snag objective, including developing large trees for future snag recruitment and retaining agents of mortality or damage. To the extent practicable for the diameter and age of the stand being treated, each treatment includes retention and creation of snags to meet the DFC. Publications useful in identifying snag-related DFCs include but are not limited to Spies, et al.

To the extent snag requirements for late-successional species are known, one objective is to attain 100 percent of potential populations for all snag-dependent species.

7. The project-related habitat improvements outweigh habitat losses due to road construction.

Cited References:

- Carey, A.B., and M.L. Johnson. 1995. Small mammals in managed, naturally young, and old-growth forests. Ecological Applications 5:336-352.
- Graham, R.T., A.E. Harvey, M.F. Jurgensen, T.B. Jain, J.R. Tonn, and D.S. Page-Dumroese. 1994. Managing coarse woody debris in forests of the Rocky Mountains. Res. Paper INT-RP-477. USDA Forest Service, Intermountain Research Station, Ogden, UT. 12p.
- Spies, T.S. and J.F. Franklin. 1991. The structure of natural young, mature, and old-growth Douglas-fir forests in Oregon and Washington. Pages 19-121 in: Ruggiero, L.F., K.B. Aubry, A.B. Carey, M.H. Huff (tech. coords). Wildlife and Vegetation on Unmanaged Douglas-fir Forests. Gen. Tech. Rep. GTR-PNW-285. USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

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MEMORANDUM

DATE:

September 30, 1996

TO:

Regional Interagency Executive Committee (RIEC)

Mike Collopy, Center Director, Forest & Rangeland Science enter, National Biological Service

Ken Feigner, Director, Forest & Salmon Group, Environmental Protection Agency

Thomas Mills, Station Director, Pacific Northwest Station, Forest Service

Thomas Murphy, Director, Environmental Research Lab, Environmental Protection Agency

Stan M. Speaks, Area Director, Bureau of Indian Affairs

Michael J. Spear, Regional Director, U.S. Fish & Wildlife Service William Stelle, Jr., Regional Director, National Marine Fisheries Service William C. Walters, Deputy Field Director, National Park Service

Robert W. Williams, Regional Forester, R-6, Forest Service

Elaine Y. Zielinski, State Director, Oregon/Washington, Bureau of Land Management

SUBJECT:

Amendment to "Criteria to Exempt Specific Silvicultural Activities in Late-Successional Reserves and Managed Late-Successional Areas from Regional Ecosystem Office Review" of July 9, 1006

of July 9, 1996

On July 9, 1996, the Regional Ecosystem Office (REO) released criteria to exempt certain commercial thinning projects in Late-Successional Reserves (LSRS) and Managed Late-Successional Areas (MLSAs) from review. The memo stated, in part, that the "REO will consider supplementing or modifying these criteria over time." This memo contains the first amendment to the July 9 criteria.

After issuance of the July 9 criteria, members of my staff and the LSR Work Group continued to review current research, particularly that of Drs. Andrew Carey and Connie Harrington on commercial thinning in northwest Washington. Based on this additional review, it is apparent that although 1/4 to ½ acre openings will add structural diversity in some stands, they are larger than needed to improve small mammal populations (forage species for northern spotted owls), and are larger than normal processes would typically create in the course of naturally developing late-successional forests. "Best guess" thinning studies currently being conducted by the researchers do not include openings this large. Therefore, the second and third bullets under Treatment Standard #4 in the July 9 Exemption Criteria are combined to now read:

"Three to 10 percent of the resultant stand would be in heavily thinned patches (i.e.,, less than 50 trees per acre), or in openings up to 1/4 acre in size, to maximize individual tree development, encourage some understory vegetation development, and encourage the initiation of structural diversity."

Please implement this amendment at the earliest convenient time. However, projects already plained under the original July 9, 1996, version of the exemption criteria remain exempted from REO review. We suggest you transmit this amendment to your field units at your earliest convenience.

cc:

REO Reps LSR Work Group 801/ly